TECHNOLOGY DEPT.

# Telephone ENGINEER and MANAGEMENT

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NOVEMBER, 1945

*Featuring*

USE OF NITROGEN GAS IN CABLE WORK
*By B. C. Burden, Technical Consultant*

*Editorial Index page 8*

THE COVER PICTURE—

The VICTORY LOAN DRIVE will be the last public offering of bonds. Let's make it the best drive of all. The fighting job has been victoriously ended, but let's finish the job of paying the bill as effectively as our other War jobs were accomplished.

VOLUME 49, NUMBER 11. Published monthly by Telephone Engineer Publishing Corporation. Office of Publication, Pontiac, Illinois. Executive and Editorial Office, 7320 Sheridan Road, Chicago, Illinois. Subscription: U. S., Cuba, Mexico, $1.50 per year; Canada $2.00, in all other countries, $3.50. Single copies, U.S.A., 15 cents; single copy JANUARY 15 BLUE BOOK BUYER'S GUIDE $1.00. Entered as second class matter at the post office at Pontiac, Illinois, under the act of March 3, 1879.

**All in favor raise right hands . . . *with wallets***

**Naturally we want** our boys home.

But how much are we willing to do about it?

Are we willing to pay for bringing them back? If we are, we'll buy *extra* Bonds in the Victory Loan.

And after these fellows get home—what then?

**We want to take care** of the injured ones, of course. We want to give our boys a chance to finish their education. We want to see that there are plenty of decent jobs for them.

How much are we willing to do about that?

If we're really serious about wanting to see that our men get what they have so richly earned, we'll buy *extra* Bonds in the Victory Loan.

**Now's the time.** Let's have a show of hands—with wallets—to prove how much we really want to hear that familiar voice yelling "It's *me!*" Let's prove, with pocketbooks, that we can do our job as well as they did theirs.

**THEY FINISHED THEIR JOB—**
**LET'S FINISH OURS!**

VICTORY LOAN


THE MAGAZINE OF THE TELEPHONE INDUSTRY

# INDUCEMENT THROUGH PERFORMANCE

## Operating Companies' Experience Results In Ever-Widening Use of LEICH Equipment

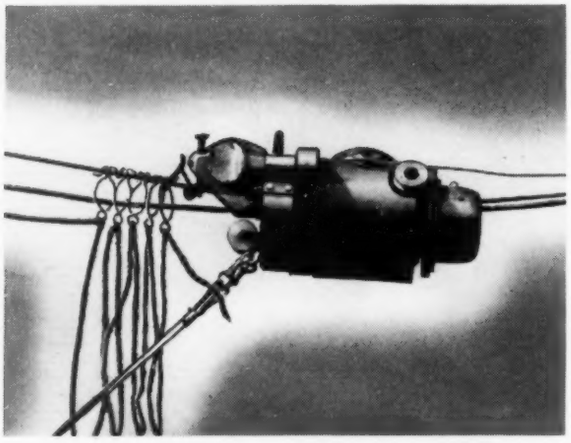
The day-to-day work performed by Leich equipment has been the chief reason for its success. In the beginning, Leich telephones and switchboards were employed almost entirely in the area within a few hundred miles of the Leich factory. Today, Leich equipment is used by telephone companies throughout the world. What inducement has led so many telephone operating men to adopt Leich equipment? Simply a trial of it. Every Leich telephone and switchboard is engineered and constructed to earn the approval of practical telephone men. Specifications, prices and delivery schedules on all Leich equipment may be obtained by writing Leich Sales Corporation, 427 W. Randolph Street, Chicago, Illinois.

# LEICH

MANUFACTURERS OF TELEPHONES, SWITCHBOARDS

AND RELATED APPARATUS SINCE 1907

**Dead Ending is Easier** when you use the Nicopress Method! All you do is insert the wire and compress the dead-end with the Nicopress Tool. The finished dead-end is stronger than the wire itself! They are part of a complete line made by NATIONAL TELEPHONE SUPPLY COMPANY.



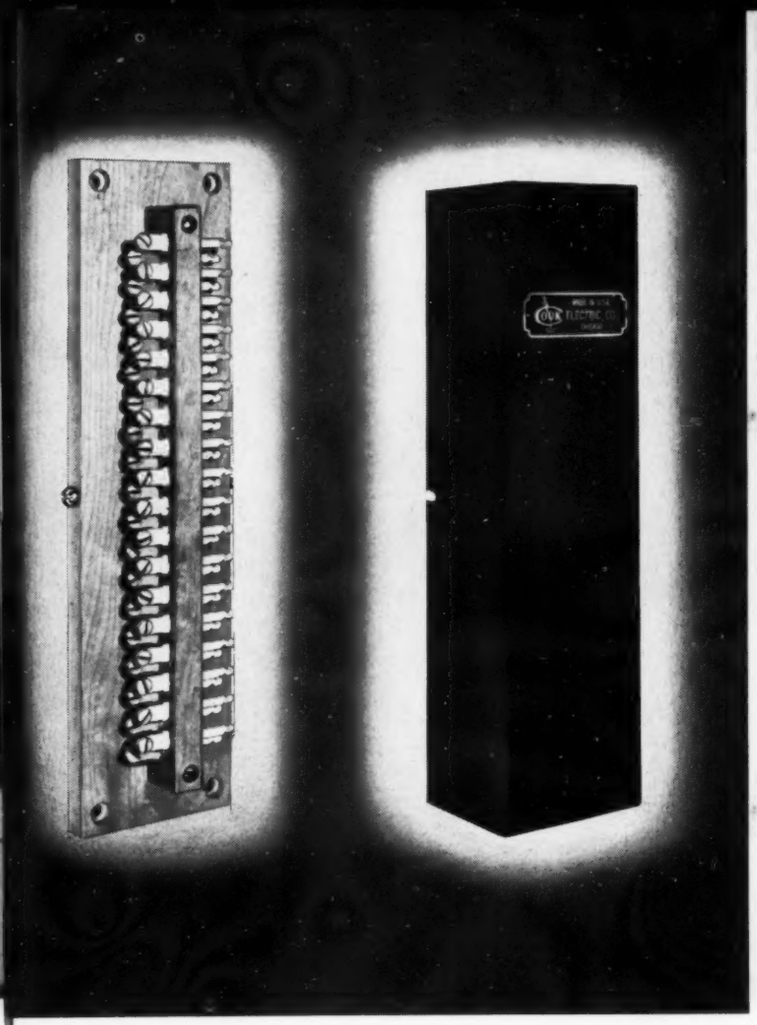
**Lower Costs on New Construction!** The new Model "D" Neale Cable Spinner is a pull-type spinner built to withstand rugged operating conditions. This CABLE SPINNING EQPT. CO. product is equipped with a double drive mechanism, ratchet lock and detachable ring pusher.

**Shock-Absorbing "Spot-Light!"** Flexibal Guy Guards are *sensible*. Easily and quickly installed, they're aluminum coated, give lasting protection day and night. Made of short sections of wood, they absorb impacts, prevent damage to themselves or striking objects. Once installed, these S. E. OVERTON products stay on the job without requiring attention. Write for Bulletin.

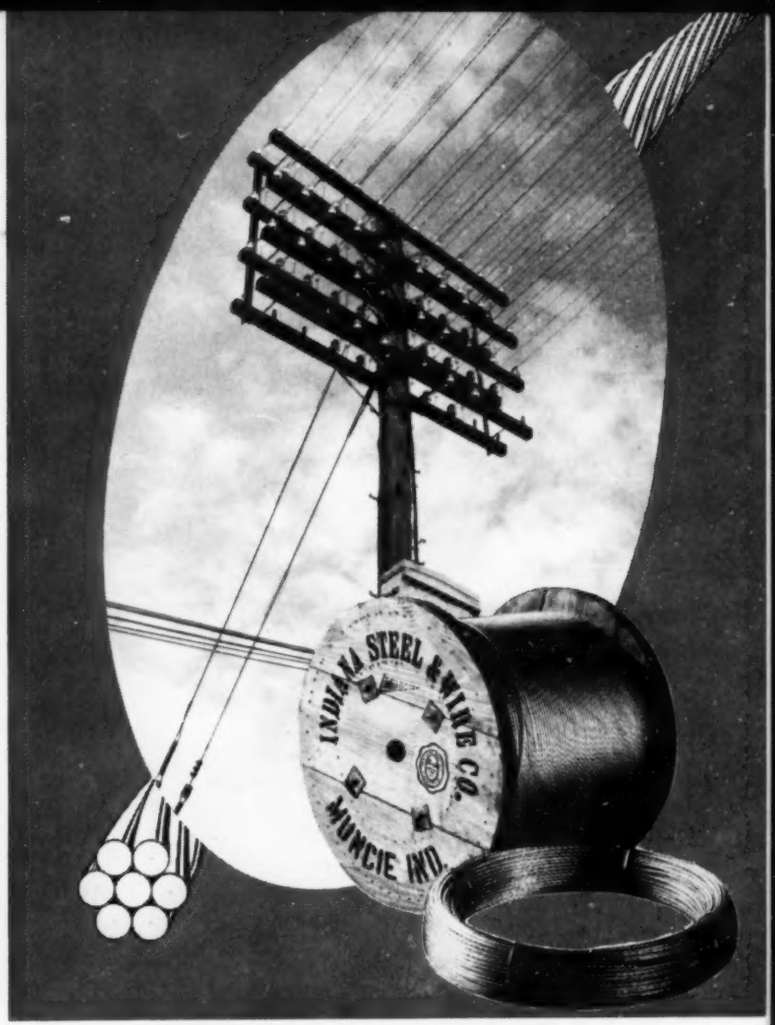
**Not a Kink in a Carload!** Kellogg Koiled Kords always stay out of the way and thus help reduce telephone breakage caused by dangling cords. The outer rubber cover is permanently molded in a spiral shape, thus assuring natural, uniform retractability. An exclusive KELLOGG Product.

**Doubles Battery Room Capacity!** In capacity, dimensions, and engineering features, the PHILCO Vitrabloc gives telephone engineers all the advantages of the rubber jar cell, often *doubling* the ampere hour capacity of battery rooms designed for glass jars. Built with a gleaming white, easy-to-clean glazed surface.

**Alike as Peas in a Pod.** Uniform high quality is the outstanding characteristic of all Knobs and Tubes made by PORCELAIN PRODUCTS, INC. You'll find every one the exact duplicate of every other. It's the direct result of their precision manufacture and thorough laboratory inspection.



**The Practical, Economical Way** of providing screw connections for wire distribution in P.B.X. units and small unattended exchanges is with the Cook Type 54 Interior Junction Box. Used also for floor distribution of cables in factories, offices and stores, this unit, made by COOK ELECTRIC COMPANY, is ideal where economical screw connections for drop wires are also desired.




**The Time-Tested Steel Strand.** Lasting protection against corrosion is provided in Indiana Crapo Steel Strand, thanks to its heavy, ductile, tightly-adherent coating of zinc, applied by the famous Crapo Galvanizing Process. This, plus rugged strength, are your assurance of long life and low maintenance with this product, made by INDIANA STEEL & WIRE COMPANY.

# KELLOGG Recommends and Guarantees These Finer Supplies

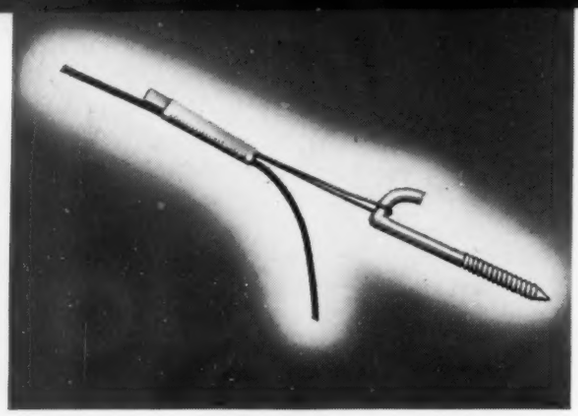
**. . . and that is your assurance that the line supply and construction materials shown here—all products of leading manufacturers—can be relied on for dependable service and lasting satisfaction. Like all line supplies listed and described in the Kellogg catalog, they are backed by the famous Kellogg "double guarantee." This is your best assurance of getting materials that will perform properly over a long period of time. Send your orders to . . .**

**KELLOGG SWITCHBOARD & SUPPLY COMPANY**

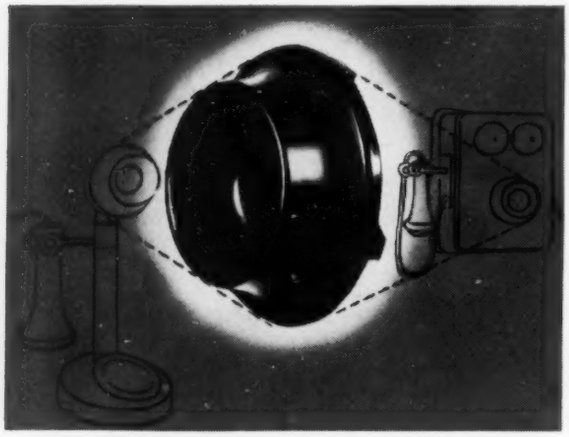
**Factory and General Offices: 6650 South Cicero Avenue, Chicago 38, Illinois**

**Branch Offices: Kansas City San Francisco St. Paul Los Angeles**

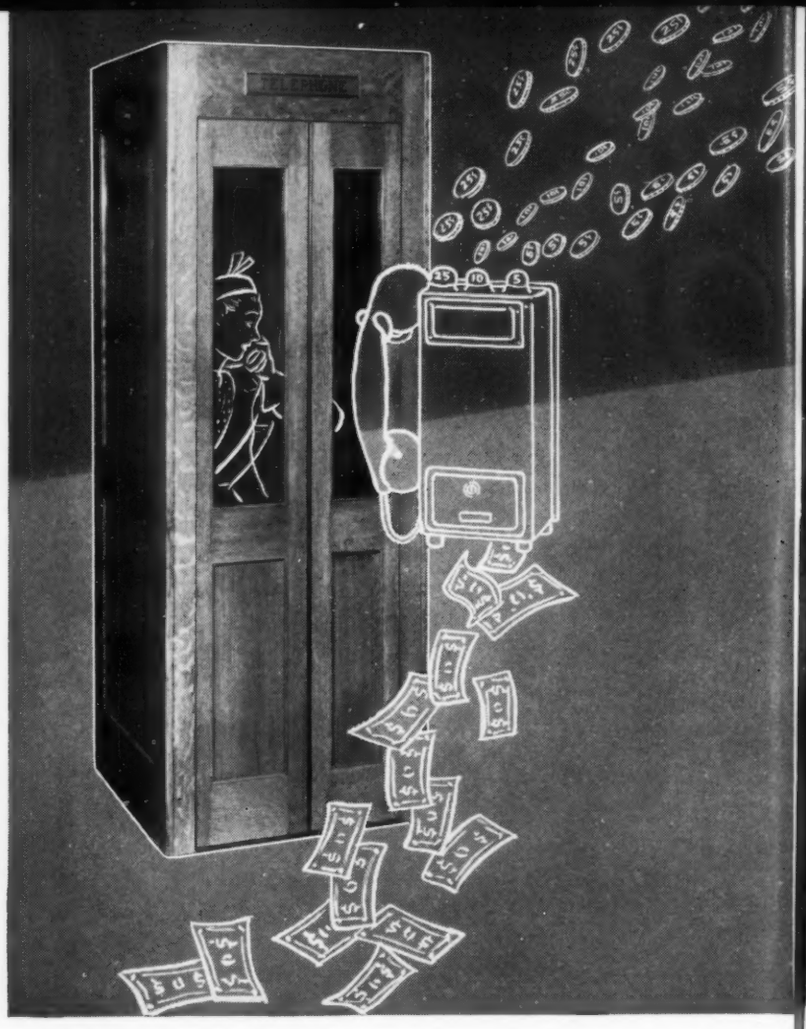
## Order Your Line Supplies from KELLOGG



**No Snubbing or Rubbing.** Reliable Drop Wire Clamps, made by RELIABLE ELECTRIC CO., are particularly adapted to No. 17 A.W.G. Twisted Pair Wire or Parallel Drop Wire. They permit free swinging, place wear on hardware, eliminate sharp bends, and prolong wire life.

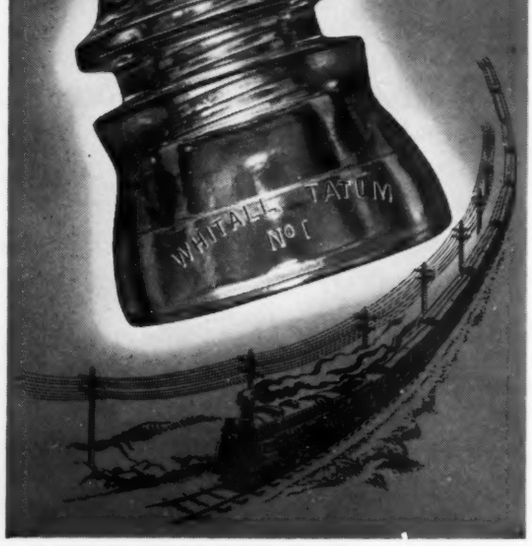


**You Can Standardize** on one single transmitter unit when you use the KELLOGG Type 121 Transmitter Front. This versatile unit takes the famous Non-Positional Handset Transmitter, makes it standard for *all* types of sets! The Type 121 fits all Kellogg wall sets and desk stands.



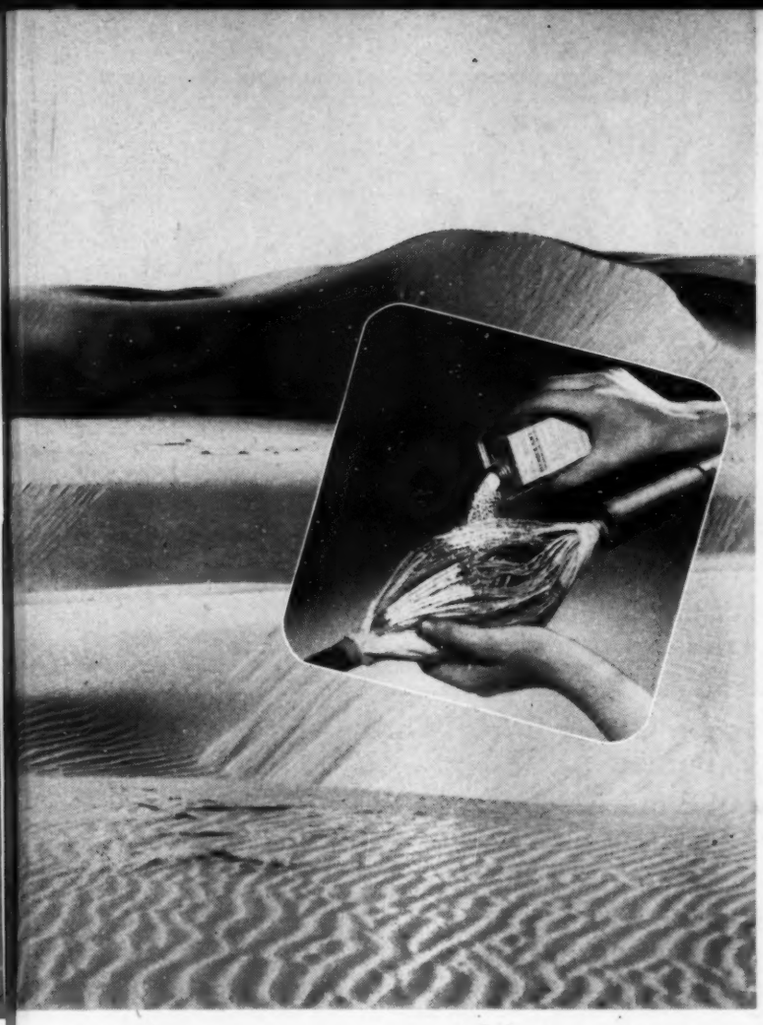

**Throughout the Country** it has been proved over and over that pay station revenues increase when the public is given the privacy of telephone booths. Churchill Booths particularly have the roominess, comfort, and privacy which attract business. A popular example is CHURCHILL CABINET CO.'s No. 100 Booth, acoustically designed, with automatic light and ventilator.

**It Just Won't Move.** Over 25 years ago, this railroad bridge over a bayou near New Orleans was anchored with W. N. MATTHEWS CORP. Scrulix Anchors that are still holding firmly today—convincing proof that *all* swamp and regular earth type Matthews Anchors do a dependable job.



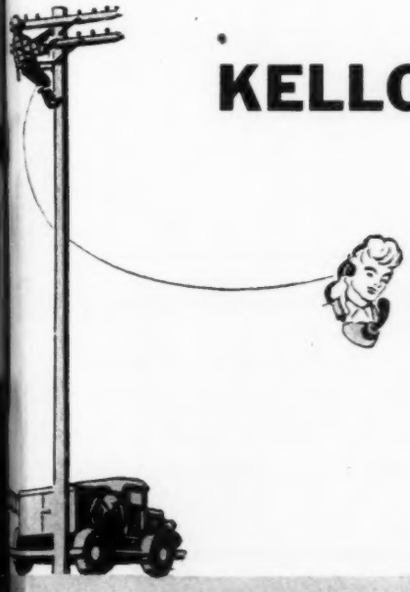

**Meet Every Service Need.** That's why so many telephone companies use Armstrong's Whitall Tatum Insulators. Products of ARMSTRONG CORK COMPANY, these quality insulators have such outstanding features as crystal clarity of glass, accurate gaging, and unusual resistance to wide variations in temperature.

**Not a Kink in a Carload.** Kellogg Koiled Kords always stay out of the way and thus help reduce telephone breakage caused by dangling cords. The outer rubber cover is permanently molded in spiral shape, thus assuring natural, uniform retractability. An exclusive KELLOGG product.



**Drier Than the Driest Desert!** Drierite Desiccant is the safer way to dry out splices in lead covered cables. After splicing, all you have to do is bind a cotton gauze under the splice and sprinkle Drierite granules in among the conductors. This W. A. HAMMOND DRIERITE COMPANY product absorbs all moisture, thus making the splice about the driest part of the entire cable line.

**A Must Item** in any service or repairman's kit is a Vulcan Electric Soldering Iron. Made by VULCAN ELECTRIC CO., these irons assure a long life of unimpaired heat production. They come in 14 standard sizes of screw tip and plug tip types. Tips are hand forged of purest copper. They are part of a full line including rheostats, thermostats, iron holders, pots, ladles, etc.



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## Order Your Line Supplies from KELLOGG

## "It Seems to Us"

**A prestidigitator is not something out of the dictionary when John Brown Cook, president of Reliable Electric Co., Chicago, is away from the office. He is well known in magical circles as being one of the best amateur magicians in the country. It seems however, that what we used to call a magician has grown up to the name of prestidigitator—which is quite a trick in itself.**

•

You men looking for a hobby might be interested in the one of Frank J. Whicher, chief switchman in the North Office, Long Beach, of the Associated Telephone Co., Ltd. in sunny California. Whicher's backyard buzzes constantly because of the 45 colonies of bees he raises "just for fun" and maybe just for the half ton of honey he harvested last year. If you are still interested, write the company for the October **Associated Circle** and read all about Whicher and his pets.

•

**While writing of California we are reminded that we had been wondering what Fred Norris, v. p. of the Associated company did as his hobby. Being where he is we could easily imagine that Betty Grable or Ingrid Bergman might be his hobby as Californians seem to do the things we only dream of—but no, Fred is a deep sea fisherman, believe it or not. Fine business if you can get it!**

•

Kemp Haythorne, familiar to Independents as the able representative of wire goods from U.S. Rubber Company, can always be depended upon to check carefully every issue we publish. His tips of coming events have resulted several times in our being able to check up and present editorial material extremely important to our industry.

Unlike many persons in our field Kemp has four hobbies: (1) "To learn a little something. (2) To please a dear good wife, (3) To get little evils out of me, (4) To do my job." He tells us his hobbies keep him fully occupied.


# TELEPHONE ENGINEER & MANAGEMENT

**Vol. 49, No. 11** **NOVEMBER, 1945**


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**SERVING THE SIX BILLION DOLLAR TELEPHONE INDUSTRY**

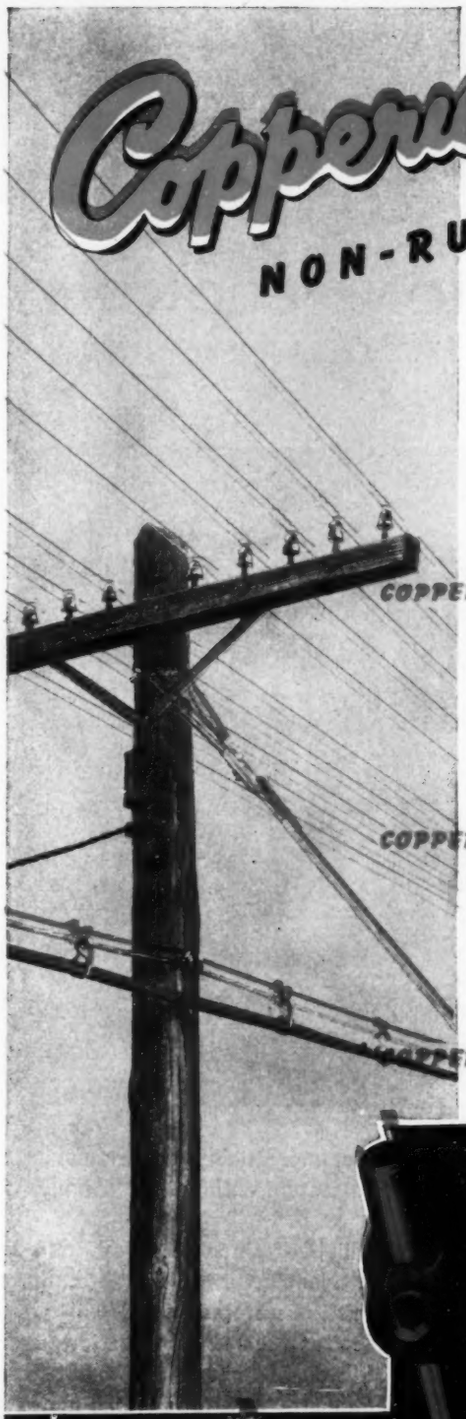

*Founded in 1909*

Office of Publication, Pontiac, Illinois. Executive and Editorial Offices 7720 Sheridan Road, Chicago 26 Illinois. Phone Rogers Park 3040. RAY W. SMITH, Editor: ROY F. SMITH, Adv. Manager, DON C. SORENSEN, Sales Prom. Mgr. Subscriptions: U. S., Cuba, Mexico $1.50 Per Year; Canada, $2.00; In all Other Countries, $3.50. Single copies, U.S.A., 15 cents. Single copy JANUARY 15 BLUE BOOK BUYER's GUIDE $1.00. All subscriptions should be sent DIRECT to 7720 Sheridan Rd. Chicago 26, Illinois.

# Copperweld

NON-RUSTING, LONG-LIFE

LINE WIRE
DROP WIRE
STRAND
GROUND RODS



***Many telephone companies use Copperweld Products to reduce maintenance and replacement costs and to increase safety and dependability.***

COPPERWELD **LINE WIRE**

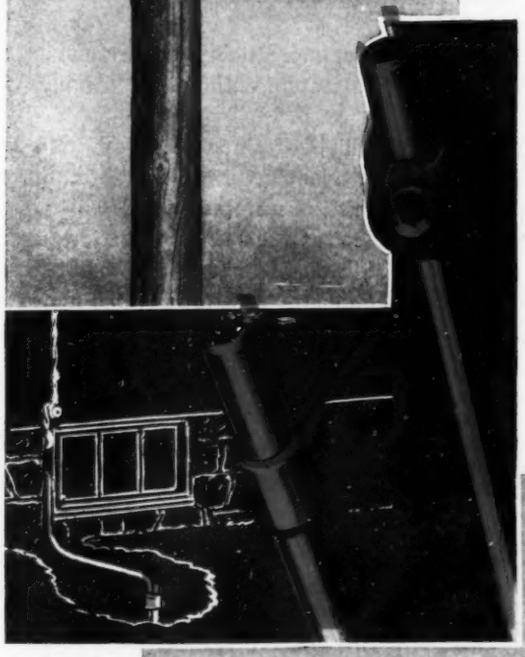
The thick copper exterior with a core of high strength alloy steel permits long span construction—prevents corrosion and rust. Copperweld provides high conductivity and excellent voice and high frequency transmission characteristics. It is light in weight, small in diameter and is easy to string.

COPPERWELD **DROP WIRE**

The strongest drop wire made. Its core of high strength alloy steel prevents stretching and enables it to stay up under heavy ice and wind loadings. No. 17 AWG Copperweld parallel or twisted pair drop wire has a guaranteed breaking strength of 400 pounds, No. 18—340 pounds.

COPPERWELD **GUY AND MESSENGER STRAND**

Combines the permanence of copper and the strength of steel. The thick ductile copper layer will not crack, flake or peel. Serving, bending, or clamping will not harm Copperweld strand—thus assuring long life at low overall cost.



COPPERWELD **GROUND RODS AND CLAMPS**

Non-rusting and easy to drive. Copper-to-copper contact (copper ground lead to copper-covered rod) eliminates the possibility of electrolytic corrosion because there are no dissimilar metals in contact. You can forget your grounding problems once you install Copperweld.

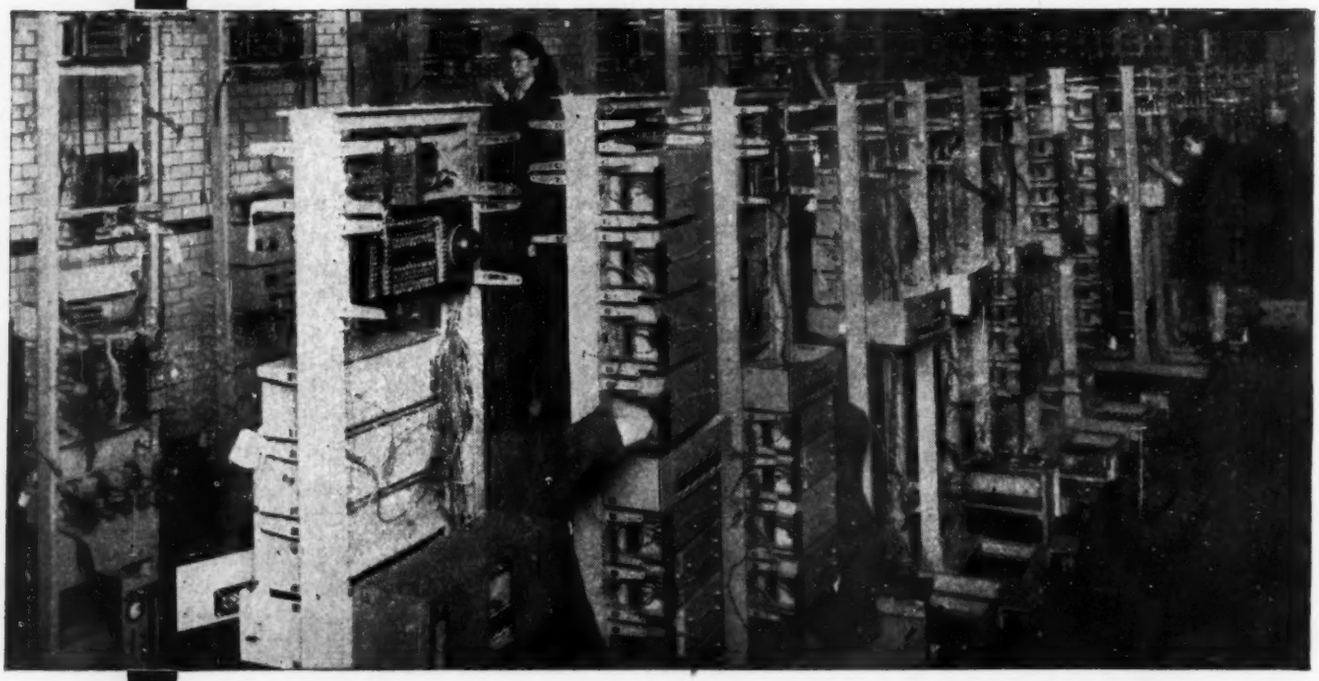
ARMY E NAVY

***For the BEST in TELEPHONE PRODUCTS above and below the ground, USE Copperweld***

**COPPERWELD STEEL COMPANY** GLASSPORT, PA.

# EXECUTIVES !

## TELECOMMUNICATION ECONOMY WITH EFFICIENCY



The evergrowing demand for telecommunication facilities over increasingly greater distances has created the need for a more economic line transmission system without the sacrifice of efficiency.

Appreciating the universal advantages to be gained the highly-trained technical staffs of Automatic Telephone & Electric Co., Ltd. and Telephone Manufacturing Co. Ltd., have collaborated in the development of multi-channel line transmission systems.

These provide facilities for several simultaneous, independent and secret conversations over each pair of wires in a cable or overhead line network. Additional transmission channels can thus be provided as required and a greater volume of telephone or telegraph traffic handled without installation of expensive additional cable or open-wire circuits.

Our Technicians will gladly assist with detailed information on—

**ATE/TMC** **TELECOMMUNICATIONS TRANSMISSION EQUIPMENT**

MANUFACTURERS

*Please address enquiries to:—*

**AUTOMATIC TELEPHONE & ELECTRIC CO. LTD.**
STROWGER WORKS, LIVERPOOL
ENGLAND

**TELEPHONE MANUFACTURING CO. LTD.**
WEST DULWICH, LONDON, S.E.21
AND ST. MARY CRAY, KENT, ENGLAND

A8022-A5

# ADVANTAGES OF THERMOPLASTIC

There are fourteen practical advantages of theremoplastic insulation over older types of construction . . . advantages which PLASTIC engineering now makes possible at what, in most cases, is NO PRICE PREMIUM. Check them yourself: 1. Superior aging properties, 2. High resistance to oxidation, 3. Low moisture absorption, 4. High dielectric strength, 5. High tensile strength, 6. Resistance to flame, 7. Flexibility at low temperatures, 8. Resistance to abrasion, 9. Resistance to chemicals, 10. Resistance to oils and greases, 11. Ease of installation, 12. Increased capacity, 13. Attractive appearance, 14. Broad color range. Remember . . . when you're thinking of PLASTIC you're thinking of US!

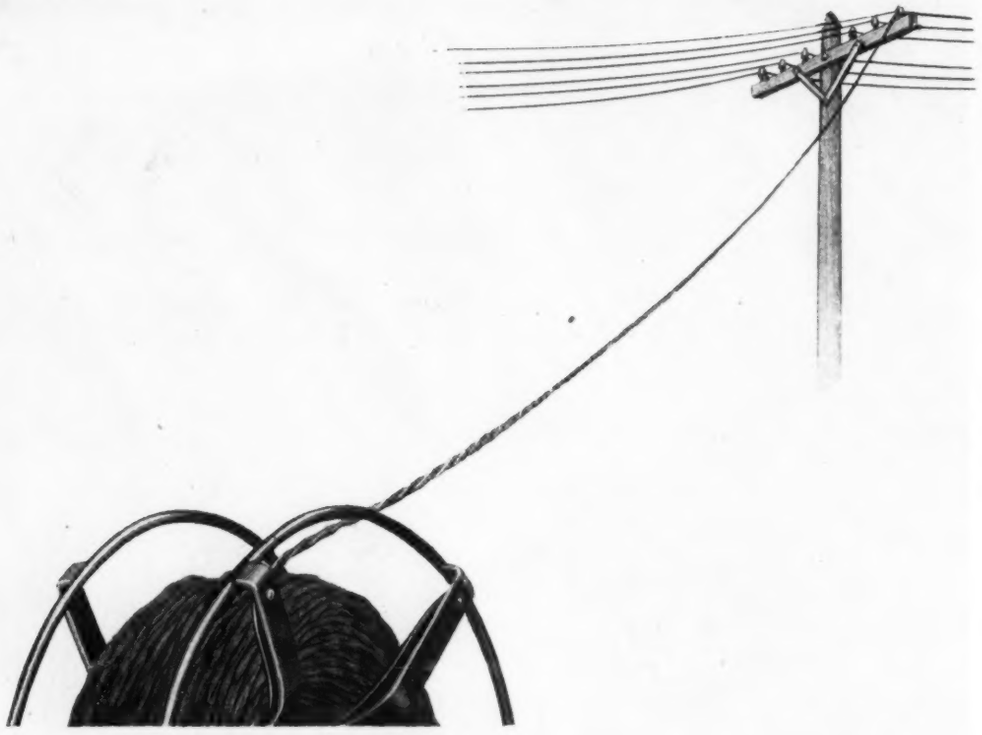
**Thermoplastic insulation specialists . . . producing a complete line from fine wires to heavy power cables . . . serving: Public Utilities, Radio, Electronic, Appliance and Instrument Manufacturers, Telephone Companies and Contractors.**

# PLASTIC

## WIRE & CABLE CORPORATION

NORWICH CONN

# Right Off the Reel



# MONOTYPE DROP WIRE

You ***know*** you've bought quality, when Monotype Drop Wire pays off the reel. Its tight, firmly braided covering is ***twice***-coated to battle weather and moisture, and slicked smooth with a generous dusting of mica. It is clean and easy to work with. It looks right, it handles right—it IS right. Monotype Drop Wire will reward your judgment with years of satisfactory service. When you ***must*** buy drop wire, be sure to get Monotype quality. And please order well in advance of anticipated requirements.

MANUFACTURED FOR

**AUTOMATIC ELECTRIC COMPANY**
**By GENERAL CABLE CORPORATION**

DISTRIBUTED BY

**AUTOMATIC ELECTRIC**
**SALES CORPORATION**

1033 WEST VAN BUREN STREET · CHICAGO 7, ILLINOIS

*Now-Modernize with*

# PHILCO FLOTÉ TELEPHONE BATTERIES

For the expanded telephone needs of the years ahead Philco is ready with a selection of modern Storage Batteries, engineered for this specialized service. These incorporate the advanced Philco Floté grid . . . a special development for full float service which eliminates low cells, reduces internal losses and adds greatly to battery life. Specify modern Philco Floté Telephone Batteries, in Steel Glass, Rubber or Vitrabloc jars. Write for new catalogs giving specifications.

PHILCO CORPORATION
Storage Battery Division, Trenton 7, N. J.
*Makers of the famous Philco "Thirty"*

# PHILCO

*Famous for Quality the World Over*

*Tune in The Radio Hall of Fame, Paul Whiteman and His Orchestra, Sundays, 6 P.M., EST.*

FOR 50 YEARS A LEADER IN INDUSTRIAL STORAGE BATTERY DEVELOPMENT

Philco Floté Telephone Battery in annealed Steel Glass Jar.

# CALCULAGRAPH

## TOLL CALL TIMEKEEPER

MODEL 33
CALCULAGRAPH

WHERE Calculagraphs are used for timing Long Distance calls, the "*vital statistics*" (starting time and elapsed time) required for billing purposes are obtained quickly and accurately. • Recognition of the dependability of Calculagraphs for this service is their continued use, year after year, by telephone systems throughout the world.

**CALCULAGRAPH COMPANY**

INCORPORATED 1892

310 SUSSEX STREET • HARRISON, NEW JERSEY

# DO THE *Complete* JOB

## WITH A HIGHWAY MODEL HD EARTH BORING MACHINE

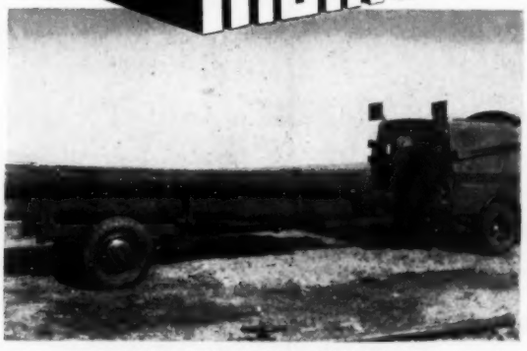
It digs holes from 6" to 20" in diameter — 7' to 10' deep in clay, hardpan, gumbo, shale, or frozen ground, and *sets the pole.*

A Model HD earth boring machine with integral winch and derrick, mounted on a 1½ ton truck, together with a Highway all-steel boring machine body, makes a complete unit that digs holes, sets poles, carries required materials and tools for the job, and serves as transportation for the crew.

*Line construction and maintenance costs are reduced to a minimum with Highway equipment.*

OTHER HIGHWAY LEADERS

Model LCW-102 Body



MODEL P-8-T POLE TRAILER

Model L-12-C Winch

## HIGHWAY TRAILER COMPANY

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EDGERTON, WIS., U. S. A.

# T. M.
# ON PIES

Stands for
either

# TIS MINCE

or

# TAINT MINCE

Our work
Speaks for
itself

---

# TIS RIGHT

never

# TAINT RIGHT!

We stand behind
it

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# GUSTAV HIRSCH ORGANIZATION

***Engineers and Contractors***

**310 W. Broad St., Columbus 8, Ohio**

**Main 6533**

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***Nationally and Internationally Known***



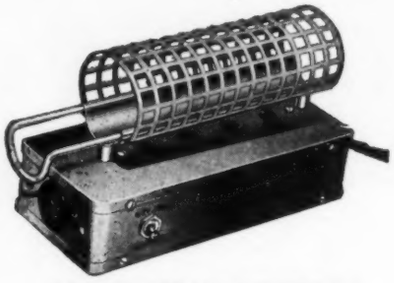
**DRAKE** — **A NAME TO REMEMBER for RELIABLE SOLDERING EQUIPMENT**

Through 25 years of soldering iron manufacturing, Drake has developed soldering products that set new high standards of quality and long-lived performance.

**DRAKE No. 400,** for example, is ideal for work in small places—weighs only 8 ounces and is only 9 inches long, yet it is a 60-watt iron.

**DRAKE No. 600-10,** is conservatively rated at 100 watts, but is only 10 inches long.

**DRAKE SOLDER POTS** are available in 150 and 300 watt ratings to meet varying needs.



**DRAKE HEAT CONTROL** is a fool-proof device for keeping idling irons ready for quick use.

*Graybar — Quality — Since 1869 — *Reg. U.S. Pat. Off. — Distributed by Graybar Electric Company

***Immediate shipment from stock on moderate quantities with priority rating of AA-5.***

**DRAKE ELECTRIC WORKS, INC.**
3656 LINCOLN AVE. CHICAGO 13, ILL.

## "LOOKS LIKE WORKING WEATHER"

Every telephone repairman knows that the toughest jobs usually have to be done in the roughest weather. When the day is biting cold and blowing hard, or snow is cross-arm deep, or flood and storm have done some tricky work, that's when the "hurry-up" calls come in. But to the seasoned lineman "it's all part of the job." He takes what comes, when and as it comes, upholding the telephone tradition of faithfulness and dependability

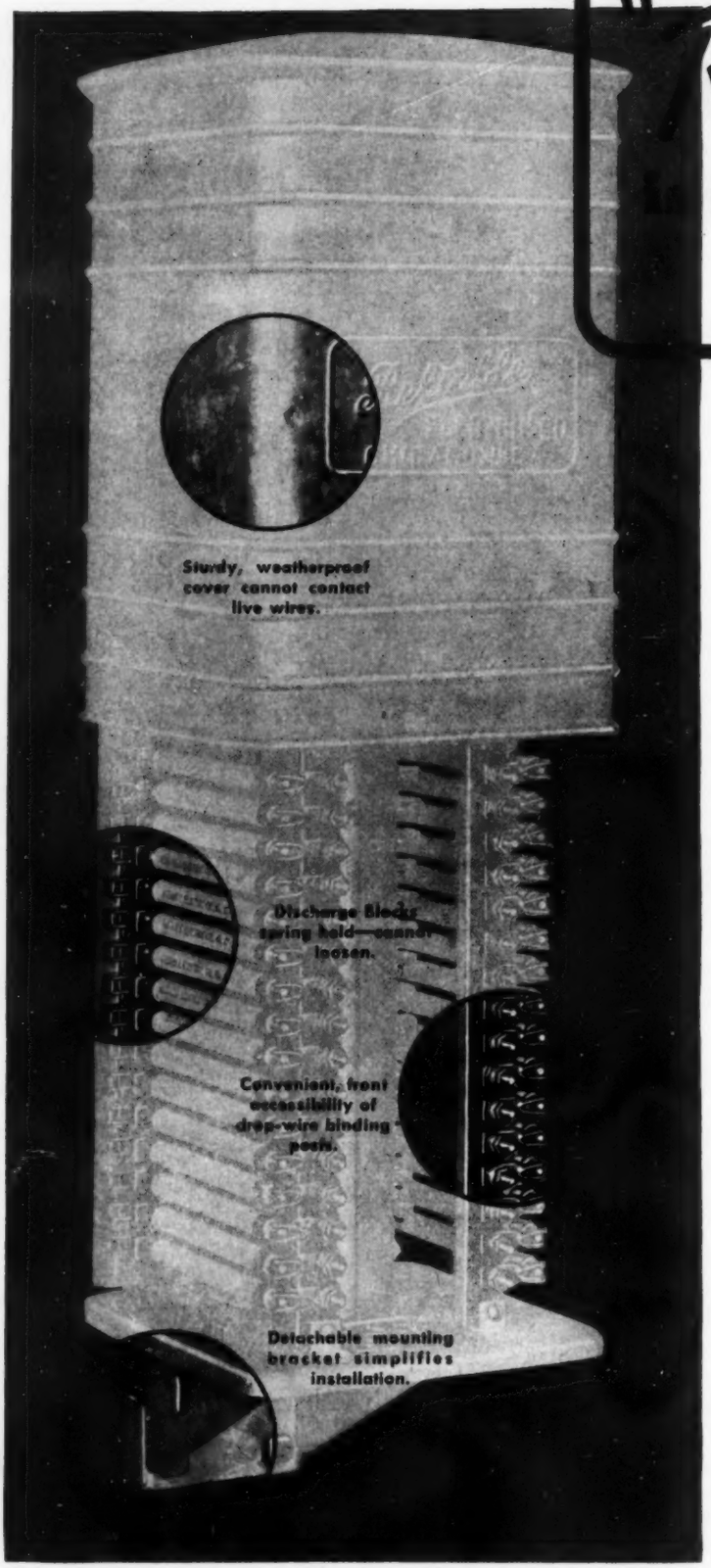
In Exide Batteries you will find the same dependability for which telephone service is famous throughout the world. Since 1895, Exides have been proving themselves worthy of that trust.

**Exide**
**TELEPHONE BATTERIES**

THE ELECTRIC STORAGE BATTERY CO., Philadelphia 32 · Exide Batteries of Canada, Limited, Toronto

# "Reliable"

## is the word for it!


Sturdy, weatherproof cover cannot contact live wires.
Discharge Blocks spring hold—cannot loosen.
Convenient, front accessibility of drop-wire binding posts.
Detachable mounting bracket simplifies installation.

A simple, conservative summary of Reliable B-Type Protector performance. This terminal is preferred for its simplicity—easy to install, easy to maintain, ruggedly constructed to outlive the cable. Proper materials and methods of manufacture, dictated by research and field experience, minimize corrosion, season cracking and other persistent evils. Reliable Self-cleaning Sawtooth Discharge Blocks are standard, dissipating static discharges without time lag or unnecessary grounding of the line. The "B" Terminals are available in 11, 16, or 26 pair capacity with type 27, 55 or 56 Reliable fuses. Code numbers are B-27, B-55, B-56.

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THE RAYTHEON RECTICHARGER, with a small storage battery floated across its terminals, provides a dependable, constant-potential battery charger and AC-to-DC power unit for a wide range of automatic communications systems.

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**THE RAYTHEON *RectiChargeR* ADDS TO BATTERY LIFE**
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**SAVES ON MAINTENANCE**
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Permits the economy of a smaller batterv.

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Maintains close DC voltage limits required by automatic systems.

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No moving parts. Nothing to wear out. Inspection once or twice a year is enough.

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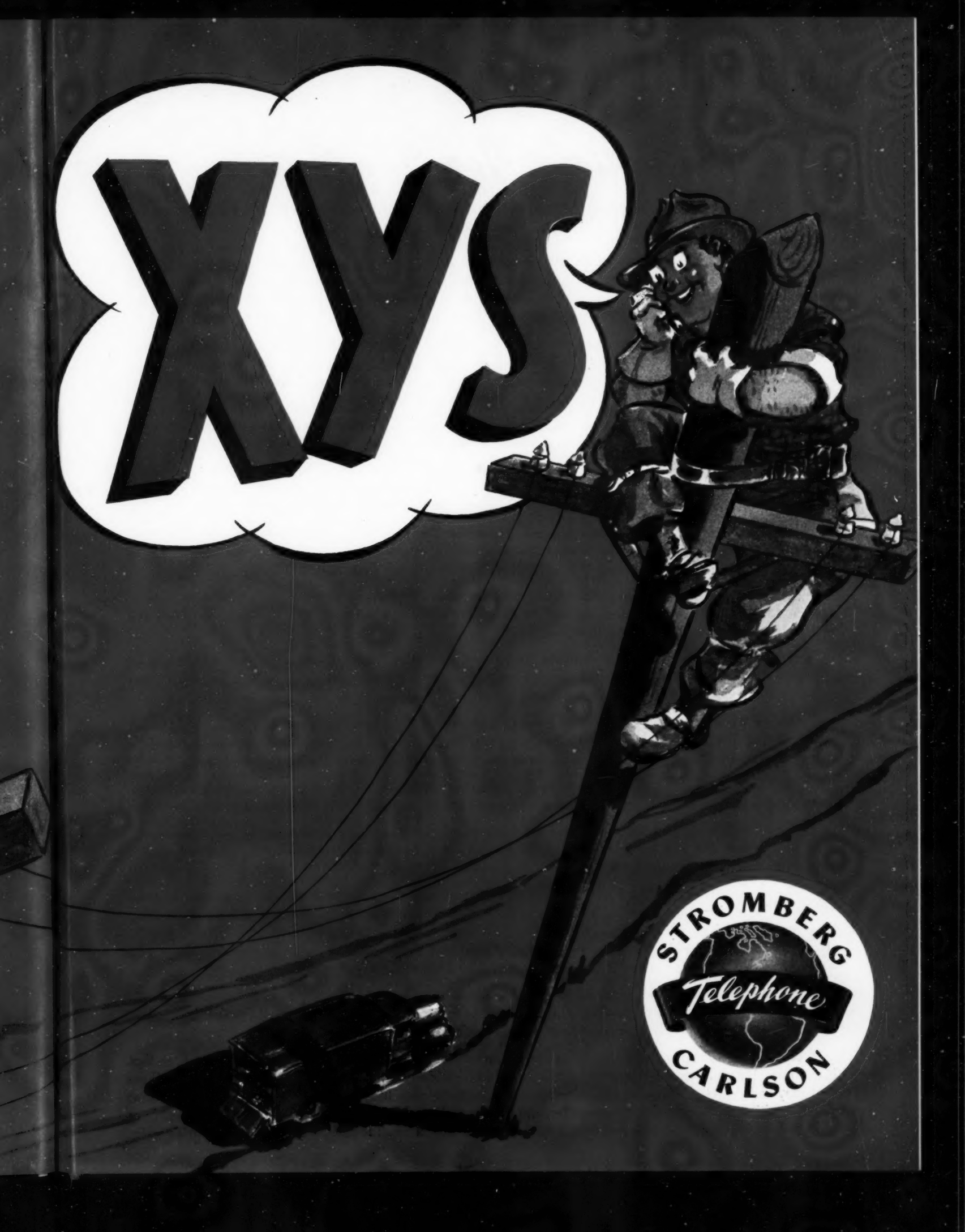
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# EDITORIAL

## The Pattern For The Future

WHAT Independent telephone companies do within the next year or so may set the pattern for Independent telephony for a long time to come.

Most Independent companies found themselves, at the end of the war, with more subscribers than they ever had before. Many of them—particularly the larger exchanges — still have unfilled orders on hand; orders that cannot now be taken care of immediately because of the shortage of instruments, materials and labor.

Even some of the most skeptical telephone men are now beginning to believe that a high percentage of these unfilled orders are going to remain good — that these people still want telephones, even if the war is over, and that they are going to keep on wanting them until they get them.

In the dark days of the Great Depression of some years back—the troublesome days of 1932 and 1933 and some subsequent years—such a situation as now exists could have been thought of by a telephone man as only a happy dream. But now it seems to actually exist; if not everywhere, then at many, many exchanges.

The conclusion must be that people have become more "telephone minded" during the war, when they became accustomed to using the telephone, or to using it more frequently.

Toll revenue continues to remain high. Undoubtedly there are a number of reasons for that, but some telephone people are convinced that one of the important reasons is that so many people have gotten into the habit of using "long distance" much oftener than they did before the war.

So here we are, with the highest existing and potential telephone development we have ever known, and the largest toll business the telephone industry has ever experienced. The question is: What are we going to do to keep the situation that way?

WE do not agree with those cautious souls who feel that, come what may and regardless of what anybody does about it, there is going to be a tremendous drop in toll revenues, and that many of the new telephone subscribers will fade away as time goes on.

One of the important principles of good salesmanship is to keep the customer sold. It is good, sound business to keep the family who has your washing machine, for instance—or your automobile or your radio or whatever you have sold them—satisfied that they have the best of its kind.

This principle is all the sounder in the telephone business, because it costs a telephone company money to take out a telephone, and it also costs money to install that instrument somewhere else.

As many telephone men admit, the telephone industry has never been heavily "sales minded." And, when they did put on sales campaigns, it was for the purpose of obtaining new subscribers, of course, rather than for the purpose of holding old ones.

We are strong for the idea of obtaining new subscribers—when the telephone company has the facilities for taking them on—but we suggest that telephone companies go further and do everything they can to convince present subscribers that they should retain their telephones. Why not, for instance, a bit of advertising or other sales activity now and then aimed directly at showing those who have telephones how important it is, to them, that they keep their telephone?

There is the danger that, when telephones are again easy to obtain, many present subscribers will order their telephone removed—simply because they feel that they can do without it for the time being, and can get it back quickly whenever they want it again.

Now is the time for the Independent telephone industry to start "consolidating its gains," so that it can go on from here. One important move in that direction would be to convince existing subscribers that they should continue to be subscribers. If the industry should reduce take-outs to a point near that number which are removed for reasons beyond the control of either subscriber or company, it would not only reduce expensive turnover of telephones, but also would considerably increase its net station gain.

# *Highlights* of the Communications News

## Important Communications developments of the past month, briefed for busy readers

by
ROLAND C. DAVIES
Editor, Telecommunications Reports

**THE Washington "kettle" of important developments for the telephone industry is boiling at a great rate after the recent rather quiescent period in the National Capital—the main ingredients are the revival of interest in Congress in rural telephone legislation; the labor situation; the pending consideration by the Senate and House Labor Committees of the boost proposal to a 65-cent-an-hour minimum wage now that the hearings have been completed; and the investigation hearings to be held by the FCC on the use of recording devices in connection with interstate and foreign message toll telephone service.**

In the near future, the Senate Agriculture Committee planned to take up the two Hill bills for consideration and to plot its future program on rural telephone expansion, but action by the Committee may possibly be deferred in the form of hearings until after the Christmas recess. On the House side, the bill by Rep. Poage (D., Texas), which would give the REA the power to make loans for rural telephone construction and expansion, has apparently been bottled up in the House Interstate Commerce Committee. Any legislation on this subject, however, is felt to stand a much better chance on the Senate side because it is sponsored by Sen. Hill of Alabama, the Democratic Whip. The Hill bill, which would give the REA the authority to make rural telephone loans, instead of his original measure to set up a separate Rural Telephone Administration, was likely to be the one selected by the Senate Agriculture Committee for consideration. This latter step appeared pretty definitely in the cards in view of Secretary of Agriculture Anderson's strong endorsement of the REA as the lending medium in a report to the Senate Agriculture Committee. (See summary of Sec. Anderson's report later in this column.)

### *Minimum Wage Activities*

**ON the minimum wage question, the Senate Education and Labor Subcommittee has completed hearings and the House Committee ended its hearings Nov. 15. Every indication is that the House Labor Committee will act first in reporting out a minimum wage measure and is expected to start consideration of the bill when its chairman, Rep. Mary Norton (D., N. J.) returns from Europe during the latter part of November. The Senate Subcommittee still has to await the return of the full committee chairman, Senator Murray (D., Mont.), who is attending the International Education Labor Conference in London. Because, on the Senate side, the legislation has to go through the subcommittee and then the full committee, the House is certain to get the jump in bringing the proposal of an increased minimum wage on the floor for debate.**

The boost to 65 cents (and three years later 75 cents) appears doomed. The best that the proponents of increasing the minimum wage can get, it is thought, will be 50 cents or 55 cents. A tip-off on a compromise to a 55-cent minimum was even given by Wage-Hour Administrator Walling in his testimony before the Senate and House Committees. Rep. Ramspeck (D., Ga.), who has been acting chairman of the House Labor Committee in conducting the hearings and is the ranking Democrat on that body, stated recently: "I think we can pass 50 cents an hour but 65 cents is doubtful." The Independent telephone industry is certain to retain the 500-station exemption for switchboard operators and might even get an increase in view of the strong testimony of USITA Executive Vice President Clyde S. Bailey and Minnesota Association Secretary-Treasurer "Jack" Crowley, who brought out that State Commissions in 1938 had favored an exemption up to 1,000 stations and that higher rates would be imperative if the minimum wage were boosted.

### *Other Legislation*

ANOTHER piece of legislation which is of interest primarily to the telephone manufacturing industry and research laboratories—the proposed National Science Foundation—has also completed the hearing stage before a Senate Subcommittee of the Military Affairs and Commerce Committees. The leading figures of the scientific world gave a wealth of testimony at the lengthy hearings—the largest compendium of knowledge on scientific research work and trends in the United States, ever presented to Congress. The legislation will take some time in going through the committees and it seems certain that treatment of patents from research through government funds will be given separate treatment.

The Labor-Management Conference, which is proceeding at full tilt as the major event in Washington to the entire nation, may later take up the question of separate treatment of disputes in the utilities field, including

Japanese telephone booths are low on privacy these days This outdoor public telephone booth at the railroad station in Omori near Tokyo draws many callers as telephones in the vicinity are reinstalled. All phone booths were burned out during the bombings.

*Acme*

communications. This subject was intensified by the bus and street-car strike in Washington when the conference started and had been previously brought to the forefront by the nation-wide four-hour work stoppage in the Bell System and the five-hour stoppage in five cities by Western Union employees. In a key position on the conference committee is a leading executive in the communications broadcasting world—Brigadier General David Sanroff, president of the Radio Corporation of America, who is also on the conference's major committee, its executive body.

### *Telephone Commission*

AS a result of the progress of the National Telephone Commission of the National War Labor Board, the wage situation in the telephone industry has been fairly satisfactorily stabilized. The telephone "house" is probably in better order than most other industries and will remain in that condition unless a wave of sharp wage increases with consequent rises in the cost of living ensues in the near future. The dominant labor organization in the telephone industry, the National Federation of Telephone Workers, is cognizant of the public reaction against strikes in the utility field and will be most cautious in exercising that weapon in the future, even though its leadership got a complete vote of confidence in the October work stoppage. The NFTW is hoping to be able to present its views to the Labor-Management Conference, although it is not a participant, at the separate committee set up to receive the views of independent unions.

### *FCC Activities*

THE FCC is concentrating almost entirely on broadcasting matters, particularly in the new fields of FM and television. But the Commission does plan to embark on a telephone regulatory subject—the use of recording devices in long-distance service—with hearings starting Jan. 10, 1945. (See detailed story later in this column.) In connection with the general and urban mobile radiotelephone service which is being established by many Bell System companies as well as bus companies, motor trucks and taxicabs, the FCC recently started expediting action on these installations through having its Administrative Board, comprised of its leading staff officials, take over their authorizations rather than burdening the members of the Commission.

### *Surplus Materials*

THE Reconstruction Finance Corporation has been reorganizing its staff that is handling the disposal of military surpluses and soon a statement of policy and program will be available. Small Independent telephone companies, which will be the main outlets for surplus telephone equipment, can write Edward Brady of the Electronics Equipment Division, Reconstruction Finance Corporation in Washington, D. C., to obtain information about surplus apparatus as he has been specially detailed by the RFC to handle their problems.

### *Rural Telephone Loans*

**UNDOUBTEDLY with the aim of trying to gain support for further expansion of the Rural Electrification Administration in its regular function of supplying farmers with electricity, Secretary of Agriculture Anderson last weekend gave strong endorsement for the use of the REA as a government medium through which loans establishing rural telephone service could be made. He filed his report with the Senate Agriculture Committee in endorsing one of two bills introduced by Senator Hill of Alabama, the Democratic Whip.**

Secretary Anderson's report was cool toward the original Hill measure which proposed a separate Rural Telephone Administration. The report revealed that the Budget Bureau also favored the REA as the agency which would develop rural telephone service rather than a new governmental bureau.

The Senate Committee had requested a report from the Agriculture Department last January, at the time of the original introduction of the RTA measure (S. 73) of Senator Hill. The second Hill bill, S. 1115, provides for funds to be loaned for rural telephone construction under REA and is the legislation favored by Secretary Anderson and the Budget Bureau.

The Senate Agriculture Committee indicated this week that it will probably decide some time next week whether to consider the legislation and as to which bill it will take up at this time.

The report of Secretary Anderson outlined reasons why rural telephone loans should be administered under the present REA. His report to the Senate Committee utilized at length the statistics and conclusions about rural telephone service which had been brought out in the FCC statement on the situation in November, 1944, and which later led to the introduction of the Hill bill (RTA) which had been drafted and sponsored by Alabama Public Utilities Commission President Gordon Persons, now aspiring to the governorship of that state. The report was undoubtedly drafted for the signature of the Secretary entirely by the REA which is under his jurisdiction.

The first reason the Anderson report stated in contending for the REA to take over this function of rural telephone loans was that most of the potential users are present or future users of REA cooperatives' electric power. Of 33 electric cooperatives queried on the subject having about 38,000 consumers in 18 states 25 said they would be interested in a cooperative telephone service. About 27,000 of the 38,000 consumers, or 73%, do not now have telephone service.

The second reason was the economy in construction and operation which might be obtained by using electric poles for telephone wires as well as the rights of way already held by REA. Thirdly, it pointed out, operating efficiency in consumer relations, in dealing with public officials, in maintenance of service, and in general overhead savings could be greatly increased by alliance with REA.

Superimposing of carrier telephone channels on electric wire was another factor cited by Secretary Anderson which might result in considerable advantage if rural telephone service were tied in with rural electric service, but the report pointed out this method needed more study before it could be perfected for use.
(This method is being tested by REA with the complete cooperation of Bell Laboratories.)

**The Agriculture Secretary told the Senate Committee that the Budget Bureau had informed him that the legislation would be consistent with government policy if it established the rural telephone program under REA, provided a 2% interest rate on loans was required and REA obtained its loans direct from the Treasury.**

The reason for the Agriculture Department's interest in the subject was stated by Secretary Anderson to be due to the fact that 75% of American farmers are without telephone service, which he said, "constitutes a public problem of considerable importance."

"The farmer has a special and peculiar need for telephone service owing to his distance from town and from his neighbors," the report continued. "The farm is a place of business and it is an important asset in agricultural economy as well as a domestic utility for health, safety, and convenience."

Using the FCC reports' statistics that in 1940 only 25% of U. S. farms had telephone service and that the percentage had decreased from 1920

(Please turn to page 56)

# NEWS Briefs...

## Radiotelephone Service to France Reopened

Radiotelephone service between France and the United States, interrupted since the German occupation in May, 1940, was restored for public use on November 7 according to the AT&T. While evacuating the Paris area the German armies wrecked the French transmitting station at Pontoise, so that new short wave radio equipment had to be shipped from this country and installed before the transatlantic service could be resumed.

The rate for a three-minute call between New York and Paris has been reduced to $12. Before the war, France was one of the heaviest traffic points in Europe for the transatlantic radiotelephone service.

## FCC Approval of Mobile Radio Systems

Demonstrating the effectiveness and speed of its new procedure in the approval of General Mobile Radio Service experimental applications, the FCC Administrative Board this week granted the applications of Raytheon Manufacturing Co., Bendix's Pacific Division, Cleveland Yellow Cab Co., Highway Radio Inc., Intercity Bus Radio Inc., and of Bell System companies for ten cities. All the applications were authorized in Class 2 experimental service.

The applications granted to the Bell System companies for construction permits to render radiocommunications service on an experimental basis to land vehicles and harbor craft within range, but with permission for handling traffic on a commercial basis denied were: Southwestern Bell at Houston; Illinois Bell for the Chicago area; Wisconsin Telephone Co. at Milwaukee; Cincinnati and Suburban Bell at Cincinnati; Chesapeake & Potomac at Washington; Chesapeake & Potomac of Baltimore City for that city; Southern Bell for Miami; Ohio Bell for Cleveland; Southern Bell for Memphis, and Pacific Telephone & Telegraph Co. for the San Francisco area.

## Acquires Bell 25% Stock In United Tel.

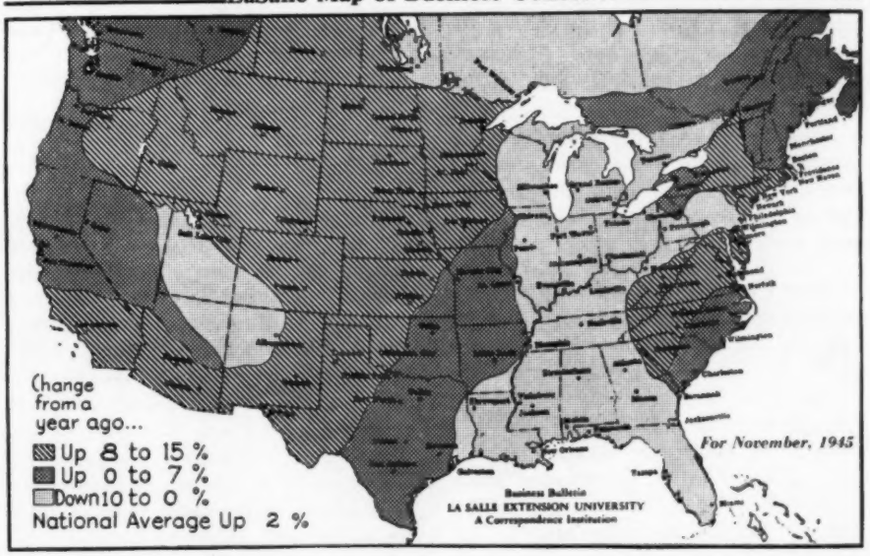
The United Utilities, Inc., Independent telephone industry holding company, announced October 30 that it had acquired the 25 percent interest in the common stock of the United Telephone and Telegraph Company which is owned by the Southwestern Bell, amounting to 6,178 shares. This gives United Utilities, Inc. 100 percent ownership in the stock of that company. The United Telephone & Telegraph Co. owns all of the common stock of the American Telephone Co. (Kansas) and the United Telephone Co. (Missouri). The consummation of the transaction was announced by President Alden L. Hart of United Utilities Inc.

## Sweden Plans Communications Expansion

Sweden's Posts and Telegraph budget appropriation for 1946-47 includes 26,495,000 Cr. for cables, 33,150,000 Cr. for telephone sets and telegraph equipment and 44,000,000 Cr. for network and carrier cable lines. The number of new telephones to be installed will probably reach 65,000, which will keep Sweden's ratio of installation to population as the second highest in the world, only exceeded by the ratio in the United States.

The wide distribution of the telephone in Swedish homes led the Ministry of Defense to install an original type of air-raid signal which turned out to be more effective than the siren which, especially at night, often was not heard because of the double doors and windows. If an air-raid alarm was to be sounded, the telephones were rung and a 50-cycle current was found best for transmitting the alarm, the normal ringing being effected by a 20-25 cycle current.

**LaSalle Map of Business Conditions**


Change from a year ago...
Up 8 to 15 %
Up 0 to 7 %
Down10 to 0 %
National Average Up 2 %
For November, 1945
Business Bulletin
LA SALLE EXTENSION UNIVERSITY
A Correspondence Institution

**Business activity is holding up well even though factory production has declined due to reconversion from war to peace, according to the LaSalle Business Bulletin for November. Consumers are buying in large amounts and their purchases offset the drop in productive activity.**

# Use of NITROGEN GAS in Cable Work

By B. C. BURDEN, Technical Consultant

DURING the last fifteen years equipment and techniques for the use of nitrogen gas in cable testing work have gradually been evolved. The use of gas in cable plant maintenance is now standard practice with the majority of the larger operating companies.

Cable faults can be located with the Wheatstone bridge with great accuracy, but measurements can be made only after a circuit failure or at least after the circuit insulation resistance is lowered to the point where sufficient current will "carry-out" to give a readable indication on the bridge. But the gas method permits sheath openings to be detected and located before moisture enters the cable and disrupts service. The Wheatstone bridge is corrective—gas is preventive.

In spite of the popularity of the gas method of testing cables there are still many operating companies that are not taking advantage of the possibilities of this method.

### *Three Primary Applications of Gas in Cable Plant*

NITROGEN gas has three primary applications in connection with the construction and maintenance of telephone cable plant. These are: (1)—For use in the location of sheath breaks in day to day cable maintenance work, (2)—As a means of drying out wet cable, (3)—For the maintenance of important toll and trunk cables kept under continuous gas pressure.

Nitrogen gas has proven particularly useful in checking wiped joints in new cable work. Pin holes not detectable with the naked eye show readily when a sleeve is placed under gas pressure and a soap solution is applied over its surface.

It is equally useful in testing newly placed sections of cable. Complete loading sections are tested by this method. The testing of sections of cable requires a more elaborate procedure than for the simple testing of splices. The condition of the sheath is determined by pressure readings taken at periodic intervals along the cable which is placed under a pressure of from 8 to 10 pounds.

It is fast becoming standard practice with cable manufacturers to test reel lengths of cable with gas before shipment. In some cases shipment is made with the cable under gas pressure while in others the gas used in factory testing is released, before shipment is made.

Large operating companies often test cable while it is still on the reel particularly when the cable is to be pulled into underground conduit.

Those proficient in the use of nitrogen gas cable work have found that under certain situations it is useful for drying out moisture. The use of gas under such circumstances may save considerable splicing work. Whether or not gas can be used advantageously for drying out moisture depends on each specific situation.

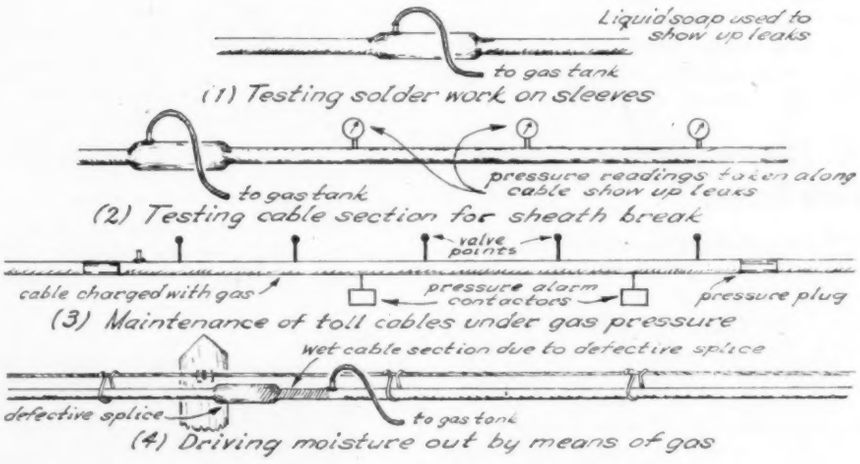

Liquid soap used to show up leaks
to gas tank
(1) Testing solder work on sleeves
pressure readings taken along cable show up leaks
to gas tank
(2) Testing cable section for sheath break
valve points
cable charged with gas
pressure alarm contactors
pressure plug
(3) Maintenance of toll cables under gas pressure
wet cable section due to defective splice
defective splice
to gas tank
(4) Driving moisture out by means of gas

Fig. 1—Principal applications of gas in cable plant.

One of the principal uses of gas is in the maintenance of important toll and trunk cables under continuous pressure. Gas offers the distinct advantages of preventing or retarding the entrance of moisture and giving an alarm at a control office when a sheath opening occurs. All important toll cables of the Bell System are now under gas pressure, as are also many important inter-office trunk cables in the larger cities. The several applications of nitrogen gas in telephone cable work are shown in Fig. 1.

### *Maintaining Exchange Cable Plant Under Gas Pressure*

IT can be anticipated that eventually the entire exchange cable plant may be placed under gas pressure. One of the principal obstacles to placing an exchange plant under gas pressure at the present time lies in the tendency of gas to slowly escape at the cable terminals. Most terminals are not sealed in such manner as to prevent gas leakage. By means of special techniques it should be feasible to seal terminals so as to eliminate the gas leakage problem and thus permit an entire exchange being placed under gas pressure. When this possibility is viewed, it would seem that it would be particulariy advantageous in the small exchange which is maintained from some distant point to have the cable plant under gas pressure with an alarm circuit arranged to signal the distant control office when a sheath break occurs and the gas pressure falls off.

### *Principal Equipment Required*

THE application of nitrogen gas to cable plant requires the following principal components: (1)—One or more cylinders of *nitrogen gas*, (2)—A *pressure regulator* and associated gauges, (3)—Fifty feet of rubber hose, (4)—Pressure testing *valves* for use at points where it is desired to take pressure readings, (5)—One or more pressure testing *gauges*.

Nitrogen gas is furnished in large steel cylinders which contain 200 cubic feet of gas under a pressure of 2000 pounds per square inch (70 degrees Fahr. The gas has neither color nor odor. It should be of the oil pumped type which insures that it is absolutely free from moisture. The gas cylinders are readily transportable and can be carried in a truck with sufficient hose to reach up to an aerial cable or down into a manhole.

### *The Regulator Valve*

IN order to furnish an adequate quantity of gas in a relatively small space it is placed under extremely high pressure. This high pressure gas must

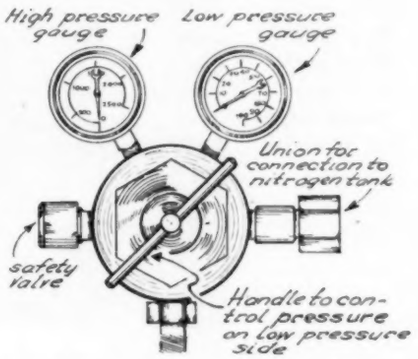

High pressure gauge
Low pressure gauge
Union for connection to nitrogen tank
safety valve
Handle to control pressure on low pressure side

Fig. 3—Detailed sketch of regulator valve.

be run through a *regulator valve* which by means of a specially constructed diaphragm reduces the pressure to a relatively low value. A high pressure and a low pressure gauge are required. The highest reading on the high pressure gauge, depending on type, is usually 2500 to 3000 pounds. On the low pressure gauge the maximum reading is from 50 to 100 pounds. The general features of the pressure regulator are shown in Fig. 3.

The pressure regulating gauge is absolutely essential as too much pressure will cause a cable to blow open at sleeves

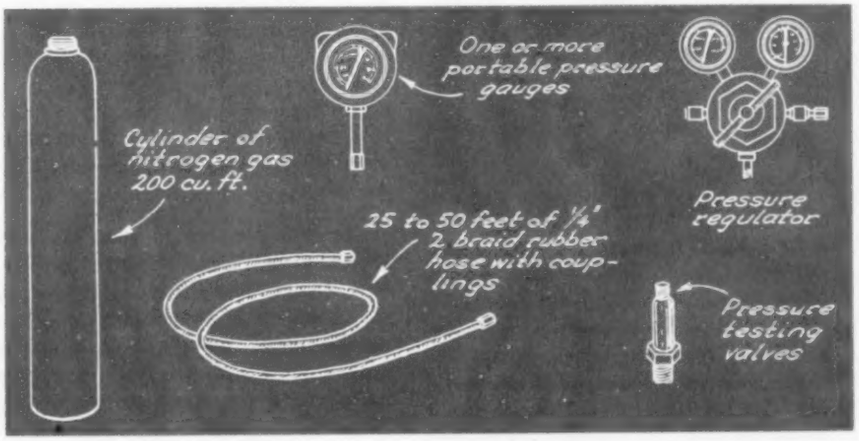

One or more portable pressure gauges
Cylinder of nitrogen gas 200 cu. ft.
Pressure regulator
25 to 50 feet of ¼" 2 braid rubber hose with couplings
Pressure testing valves

Fig. 2—Components required in applying gas to cable plant.

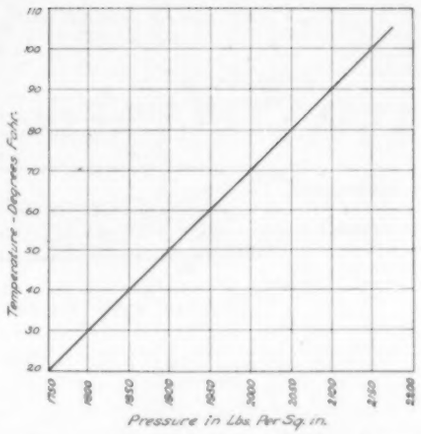



Fig. 4—Graph showing variation of pressure (high pressure side of regulator valve).

or weak places in the sheath. The pressure as shown by the low pressure regulator gauge should never exceed 35 pounds and in general it is customary to feed gas into a cable at not more than 20 pounds pressure.

As gas is released from the cylinder, the pressure as shown by the high pressure gauge diminishes and the amount of gas released (or the amount left in the tank) can be approximately determined by the reading of the high pressure gauge.

### *The Pressure Contactor*

PRESSURE contactors are used on cables which are maintained under continuous gas pressure. These are merely pressure operated switches. The switch contacts are normally open and when the gas pressure in the cable falls below some pre-set value the contact closes and an alarm is sent into the central office over a special pair. The location of the operated pressure contactor is determined by making a loop resistance measurement from the control office to the operated contactor.

The valves used in connection with pressure test points are similar to those used on ordinary automobile tires. The rubber hose leading from the nitrogen tank is equipped with standard screw or friction type chucks.

### *Characteristics of Nitrogen Gas*

NITROGEN gas of the oil pumped type in addition to being odorless and colorless has drying qualities which enhance its use for cable work. Although nitrogen gas is not poisonous certain precautions must be taken in using it in confined spaces. In underground manholes there is always the possibility of enough nitrogen gas accumulating to appreciably reduce the oxygen content of the air thereby endangering life due to a deficiency in oxygen. As previously

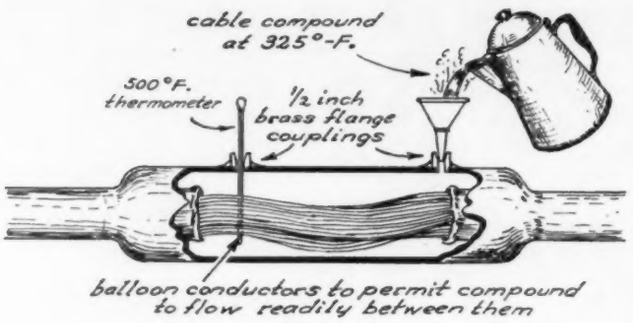

cable compound at 325°-F.
500°F. thermometer
½ inch brass flange couplings
balloon conductors to permit compound to flow readily between them

Fig. 5—Method of making pressure testing plugs.

stated, the gas in a new cylinder is under approximately 2000 pounds per square inch pressure. This amount of gas has a weight of approximately 15 pounds. The gas may be used down to the point where the pressure becomes insufficient to cause the gas to flow into the cable. The large size gas cylinders contain 200 cubic feet of gas. This is the quantity of gas contained at a temperature of 70° F. and a pressure of 2000 pounds per square inch. Then pressure of the gas increases with an increase in temperature. This fact must be kept in mind when charging cables with gas as the desired final pressure will depend on the temperature at which the pressure readings are taken.

Fig. 4 shows the variation in pressure (high pressure side) with changes in temperature for a full cylinder of nitrogen gas.

### *Pressure Testing Plugs*

WHEN cables are maintained under continuous gas pressure or where a particularly difficult location of a sheath opening is involved, it is necessary to use what are known as *pressure testing plugs*. These are merely points in the cable at which the core has been completely filled with an asphaltic compound so as to form a gas type barrier. In standard toll cables these barriers are required at ten mile intervals as well as in all connected lateral cable.

Although pressure testing plugs consist merely of completely impregnating the core and filling the splice with a compound, the procedure requires care otherwise these plugs may be ineffective and permit the passage of gas. Pressure plugs in underground cable are of course placed at manholes. Pressure plugs in aerial cable are placed near the middle of the span.

The system employed by Bell in making pressure testing plugs is as follows:

From 10 to 14 inches of sheath are removed, depending on the cable size, and the conductors are ballooned and bent downward as shown in Fig. 5. A split sleeve is placed over the sheath opening in the cable and wiped in the usual manner. Two holes ½ inch in diameter are drilled in the sleeve. One is used for admitting the impregnating compound and the other for holding a thermometer. A hole is also drilled in the bottom of the sleeve to permit the initial pouring of the wax impregnating compound to be drained out.

As the first step, a wax impregnating compound heated to a temperature of 350 degrees Fahrenheit is poured into the sleeve and allowed to drain slowly into a catch pan. The temperature inside the sleeve should be allowed to build up to not over 265 to 270 degrees. This process is continued for ten to fifteen minutes with the sleeve being kept constantly filled with hot wax. The temperature within the sleeve full of hot wax is then allowed to drop to 200 degrees F. and the drain valve is then opened and all the wax is drained out of the sleeve.

As the second step, the drain hole on the bottom of the sleeve is then closed with a small threaded brass type plug and the sleeve completely filled with a special asphaltic compound heated to a temperature of approximately 235 degrees F. The temperature within the sleeve must not be allowed to rise above 240 degrees otherwise the conductor insulation may be damaged. The two holes in the top of the sleeve should be closed with special pipe plug flanges soldered in place.

The Bell also make some use of *core constricting wooden pins* which are driven into the center of the core. These serve to prevent the impregnating compound from running back too far. They must be carefully placed to avoid damage to the insulation. They vary in diameter from ⅛ to ¼ inch depending on the size of cable. They are from 4 to 6 inches in length.

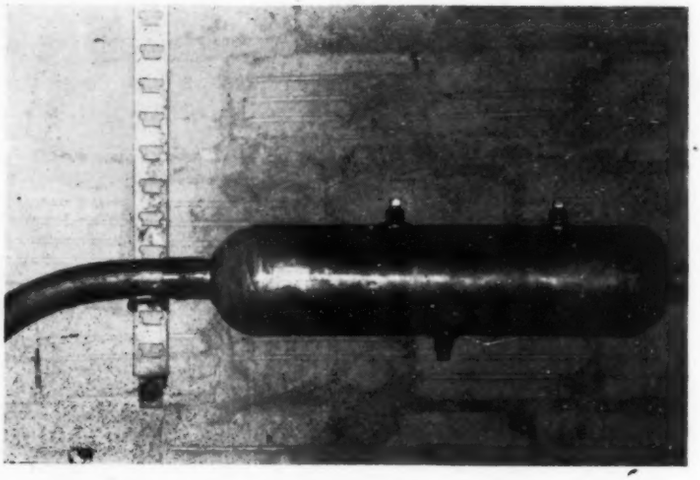


Fig. 5a—Appearance of pressure testing plug in manhole.

### *Amount of Gas Required to Charge Cable*

THE amount of nitrogen gas required for various cable charging operations depends, of course on the size of the cable, its length and the pressure required. A ten mile section of 2⅝ inch toll cable would require several cylinders of gas (for 9 pound pressure) while a thousand foot length of this cable would only require approximately 13 cubic feet from the 200 cubic foot cylinder. From this it can be seen that small size cables would require a relatively small amount of gas neglecting of course the leakage that would take place in locating sheath openings. The larger companies have worked out charts which enable them to compute the approximate amount of gas to be admitted to a cable to produce a required equalized pressure gauge of the charging cylinder. In general, one cubic foot of gas represents ten pounds drop in pressure at 70 degrees F.

The time required to charge a given length of cable depends on the type and size of cable and the charging pressure employed. In a 6000 foot loading section of standard 2⅝ inch diameter toll cable the charging time is 2 hours. In dealing with long sections of toll cable, as for example, a complete ten mile gas

(Please turn to page 64)

# National and State Association NEWS

## Michigan Convention

THE Michigan Independent Telephone Association held a one-day convention October 16 in Lansing.

There was no election of officers or directors at the convention as new officers were elected by the board of directors at an earlier meeting in the spring, at which time it was doubtful if an annual conventon could be held.

The officers of the Michigan Association are: President, E. R. Vaughan, South Haven; vice president, L. W. Reynolds, Ontonagon; secretary-treasurer, Jane McNally, Lansing.

The directors are: H. R. Christianson, Muskegon; Mr. Vaughan; R. C. Smith, Homer; B. C. Schweitzer, Owosso; Charles W. Cheeney, Chesaning; W. F. Bradstreet, Rollin; N. H. Wing, Grass Lake; B. R. Sage, Central Lake; Ernest Sprague, Lake City, and Mr. Reynolds.

The address of welcome to the convention was given by John Dethmers, attorney general of Michigan. Mr. Dethmers stated that Independent telephone companies were typical examples of small business in this country and stated that they had as essential a role in promoting the economic life of the nation as large corporations. He said it was necessary that small business be preserved and strengthened as a source of opportunities to young men who want to own their business and as the moving force in promoting private enterprise.

R. E. Putnam, commercial manager of the Michigan Associated Telephone Company, Muskegon, gave the response to the address of welcome.

The President's report was given by Charles W. Cheeney of Chesaning, the immediate past president; inasmuch as the Michigan conference was held only after the lifting of wartime restrictions this fall and really was a conclusion of Mr. Cheeney's year as president.

He stated that regardless of the industry's activities in the wartime economy, improvements have been made in the art and that prospects for future improvements in the telephone business were unlimited. All telephone companies, he felt, must gear their operations and get their houses in order so as to take advantage of the improved methods and to keep pace with the changing industrial and social life of the nation.

The address given by T. H. Dawson, general development supervisor, Michigan Bell Telephone Company, outlined that company's program for rural telephone development; and in his talk, Mr. Dawson stated that the rural telephone picture in Michigan today serves many more subscribers than in the past, and the present program of spending several millions of dollars is not just beginning but is continuing after a wartime interruption. The better type of telephone service is being brought to farmers and other remote areas in Michigan, and is not just a new program.

The talk, "The Commission's Viewpoint," by Wm. J. McBrearty, chairman of the Michigan Public Service Commission, was necessarily quite brief, because of other pressing matters that called for the chairman to be in Detroit; and therefore, his appearance served as his introduction of himself to the Michigan Association. Mr. McBrearty outlined some of the reasons for having a Service Commission, and very briefly described their method of viewing utility rates.

"Happenings in the National Association" were very ably outlined by Mr. B. C. Schweitzer, General Manager of the Union Telephone Company, of Owosso. Mr. Schweitzer briefly reviewed reports of the several committies reporting to the United States Independent Telephone Association Director's Meeting of October 2nd and 3rd. He pointed out the

**Members of the board of directors at the Virginia convention on October 26. Standing L to R: E. B. Fitzgerald, Peoples Mut. Tel. Co., Gretna, Va.; Dr. Geo. B. Cocke, Manassas, Va., F. T. Prufer, Clifton Forge Waynesboro Tel. Co., Staunton, Va.; Kelley McNish, Intermountain Tel. Co., Bristol, Tenn.; J. P. Borden, Va. Tel. & Tel. Co., Charlottesville, Va. (ex officio); W. C. Darrow, Home Tel. & Tel. Co., of Va., Tarboro, N. C. Seated L to R: W. J. Holloway, Home Tel. Co., Smithfield, Va.; Stanley A. Owens, Tri-County Tel. Co., Manassas, Va.; Lloyd C. Pulley, Tidewater Tel. Co., Warsaw, Va.; and Frank G. LaPrade, Lee Tel. Co., Martinsville, Va. Frank A. Gould and W. A. Pankey are also members of the board but were not present for the group picture.**

National Association's plans regarding pending legislation and other very pertinent problems facing the industry today.

"Victory is ours today because of the splendid job done by every boy who fought so gallantly through every hour of the war," were the words of tribute spoken by Colonel Wm. C. Henry in his address, "A Victory Directed by Communications." Colonel Henry, new President of the U.S.-I.T.A., has recently returned to the Northern Ohio Telephone Co., Bellevue, Ohio, in the capacity of General Manager. Outlining briefly the intensive plans made by the Signal Corps for the invasion, Colonel Henry stated that the war was directed by voice, as a contrast to secret code and telegraph of World War I. Colonel Henry also described the preparation, as well as the execution, of the gigantic task of invading a continent without striking at a seaport, and of the grand strategy which depended on voice communications, which concluded with the conference at Potsdam. Colonel Henry's description of the conference room and surrounding countryside, as well as the description of the personnel of our allies, was interesting and informative, and was delivered without hesitation. This address was not begun until after the adjournment of the traffic session, thus permitting those attending that session to hear the Colonel's address.

The annual banquet, in the evening, was attended by 175 people, being the largest in the history of the Association. The guest speaker was Judge George A. Malcolm, who for thirty-three years served as Supreme Court Justice in the Phillipine Islands. The Judge further commented on the ability, as a man, statesman, and general, of Douglas MacArthur, with whom he is familiar. MacArthur, he said, is as great a statesman as he is a tactful diplomat; but most of all, he is a great soldier.

General comments regarding the convention were that it was a very satisfactory meeting, as well as being well attended.

## Convention Dates

**South Carolina Telephone Association, Ocean Forest Hotel, Myrtle Beach, November 15 and 16.**

**Alabama Telephone Association, Montgomery, November 19 and 20.**

**Georgia Telephone Association, Henry Grady Hotel, Atlanta, November 22-23.**

**Minnesota Telephone Association, St. Paul Hotel, St. Paul, January 28, 29 and 30, 1946.**

**Kentucky Telephone Association, April 4 and 5, 1946; no place yet named.**

**Iowa Telephone Association, Ft. Des Moines Hotel, Des Moines, April 11-12, 1946.**

**National Executive Conference, USITA, Edgewater Beach Hotel, Chicago, Illinois, April 16 and 17, 1946.**

**Ohio Telephone Association, Deshler-Wallick Hotel, Columbus, April 23-24, 1946.**

**Illinois Telephone Association, Pere Marquette Hotel, Peoria, May 8 and 9, 1946 (tentative dates).**

**New York Telephone Association, Hotel Onondaga, Syracuse, May 22 and 23, 1946.**

**USITA National Convention, Stevens Hotel, Chicago, Illinois, October 14, 15, and 16, 1946.**

## Maine Convention

THE annual meeting of the Telephone Association of Maine was called to order by President W. J. Thompson on October 17 at the Elmwood Hotel, Waterville, Maine.

H. L. Garrish, engineer from the Public Utilities Commission, spoke regarding adequate rates and improvement of service.

The following were elected directors for the year 1945-46, C. W. Ricker, Poland Tel. Co., Poland; E. A. Van Den Kerckhoven, Van Tel. & Tel. Co., Bethel; Donald Chandler, Pine Tree Tel. Co., New Gloucester; E. D. Chase, Unity Tel. Co., Unity; Clarence Todd, Oxford County Tel. & Tel. Co., Buckfield; E. B. Holt, West Penobscott Tel. Co., Corinna; Myron Kimball, Lovell United Tel. Co., Lovell; James R. Doughty, Katahdin Farmers Tel. Co., Island Falls; E. J. St. Clair, New England Tel. & Tel. Co., Boston, Mass.

The Directors elected C. W. Ricker, president; E. A. Van Den Kerckhoven, secretary treasurer; and E. D. Chase, vice president.

Ninety-four people, representing thirty companies, were present at the convention.

## Texas Meetings

THE Texas Telephone Association held the first of their one-day district meetings in Lufkin, Texas, October 25, under the auspices of the Lufkin Telephone Company, Jean Shotwell, manager.

The following companies were represented: Lufkin Tel. Co., Two States Tel. Co., Three States Tel. Co., Gulf States Tel. Co., Conroe Tel. Co., Southwestern Bell Tel. Co., Mid-west States Tel. Co., Teneha Tel. Co., Alto Tel. Co., Livingston Tel. Co., Automatic Electric Sales Co., (Howard Housley) and Kellogg Switchboard & Supply Co., (O. C. Bailey).

The individuals present representing the telephone companies above were from various exchanges located within a 100 mile radius of Lufkin.

Mr. Shotwell made a short welcome speech and at his request Mr. Oscar Burton, president of the Association, presided at the meeting. The Acting Secretary, Miss Gertrude Tucker, spoke briefly on membership in the Association, extending an invitation to member and non-member companies and individuals to visit the Headquarters Office in Austin, and offered assistance wherever and whenever possible to telephone people. Mr. Morris Burton of the Gulf States Telephone Company, Tyler, spoke on "Telephone Service as of Today and Into The Future."

The second district meeting of the Texas Association was held in Sherman on November 9, and it is felt that a great deal of good is being derived from these discussions.

**New officers of the Virginia Independent Telephone Association left to right: W. J. Holloway, Home Tel. Co., Smithfield, vice president; Stanley A. Owens, Tri-County Tel. Co., Manassas, president; Elizabeth Dull, Harrisonburg Tel. Co., Harrisonburg, ass't. secretary-treasurer; and Lloyd C. Pulley, Tidewater Tel. Co., Warsaw, secretary-treasurer.**

# VIRGINIA CONVENTION REPORT

***By Virginia Dull***

HOTEL Roanoke was again the scene of the Virginia Independent Telephone Association meeting, as 135 conventioneers gathered on October 25th and 26th for their Eleventh Annual Conclave.

Officers elected to serve for 1945-46, were: Stanley A. Owens, president; J. W. Holloway, vice president; Lloyd C. Pulley, secretary-treasurer, Elizabeth Dull, assistant secretary-treasurer.

Directors of the Association and the expiration of their terms of office follow: Stanley A. Owens, 1946; Lloyd C. Pulley, 1946; Kelley McNish, 1946; Fred T. Prufer, 1946; Frank A. Gould, 1947; Frank G. LaPrade, 1947; W. Carter Darrow, 1948; Dr. Geo. B. Cocke, 1948; E. B. Fitzgerald, 1948; W. J. Holloway, 1948; and W. A. Pankey 1948; J. P. Borden, ex officio.

Beginning with a luncheon on October 25, the two day session got away to a good start, with an address by Clyde S. Bailey, executive vice president of the USITA, who set the pace in a serious discussion of reconversion problems confronting the whole field of telephony in the next few years.

Following the luncheon, a business meeting was held, with James P. Borden, president of the Association, presiding. Here the following committee reports were given: Resolution, Rodney Coggins; Registration, W. S. Argabright; Auditing, J. W. Holloway; Taxes, G. Fred Switzer. R. W. Edwards, connecting company agent for the C. and P. Telephone Company of Virginia, was called to the meeting to give the findings of his company on a proposed tax recommendation, which, if presented to the 1946 State Legislature, would affect Virginia telephone companies adversely.

Kelley McNish, chairman of the nominating committee, then read his report, naming five new directors for the period 1945-48. The following were unanimously elected: Dr. George B. Cocke, W. Carter Darrow, E. B. Fitzgerald, J. W. Holloway, and W. A. Pankey.

"Hospitality Hour," which met with such success last year, was again a very enjoyable occasion. G. Fred Switzer and A. W. Schell acted as co-chairmen for this hour of good fellowship and entertainment.

Friday morning again saw the meeting given over to serious discussions, beginning with an address by W. Carter Darrow, of the Home Telephone and Telegraph Company of Virginia, Tarboro, N. C., who, always alert to the most vital problems facing telephone companies, gave numerous pointers on "Building Up The Service." In his address he stressed particularly the need for a check up and facing of facts in each company, the restoration of the house to order and the laying of a foundation for the future.

Under "Checking up and Facing the Facts," Mr. Darrow brought out that due to shortages of equipment, lack of experienced personnel, increased demands for service, and maintenance problems, poorer service and nervous tension have resulted, causing less speed in handling calls, more errors and irregularities, and a loss of courtesy, which has always been an outstanding attribute of telephone men and women everywhere.

On "How to Restore the House to Order," Mr. Darrow pointed out that as it becomes available, relief equipment should be ordered to take care of immediate needs, with the view to future permanent relief as fast as it is possible; that work should be removed from the switchboard by relief equipment and auxiliary help; and that by training the presonnel in the ideals of the service—answering the subscribers promptly—acknowledging orders—keeping the customer informed through advertisments of the attempts being made to give him better service—and above all courtesy in every department of the company—this can be done.

And "On Laying a Foundation for the Future," Mr. Darrow said that we must keep abreast of the advances in scientific discoveries which are being made, and make use of these discoveries and advances in dialing, short wave, television—not overlooking the portent of atomic power.

Immediately following his address, Mr. Darrow conducted a "Traffic I.Q." having A. E. Reynolds, Intermountain Telephone Company, Miss Miller, Virginia Tel. and Tel. and Miss Hutchison, as the traffic experts, to answer questions fumbled by the audience. This questionnaire not only proved to very instructive but also a lot of fun.

B. L. Fisher, President of the Lee Telephone Company, Martinsville Virginia, then gave a most interesting demonstration and talk on "Inter-toll Dialing."

**Stanley A. Owens, President Va. Assoc.**

Mr. Fisher stated that the Lee Telephone Company was the first company in the world to be completely converted to dial. In his demonstration, for which he had an amplifying set and two loud speakers, he used a dial switchboard and a direct circuit to his Martinsville Exchange, and right from the room in which he was speaking, dialed parties in Martinsville, Stuart, and High Point, N. C., letting the audience first listen to the difference in the dial tones of each of these exchanges. This demonstration was an excellent example of what we may expect in the future in inter-toll dialing.

In the afternoon session, Arthur W. Harrison, general commercial manager of the C. and P. Telephone Company, Richmond, Virginia, gave a most timely address on what is at present a subject commanding the interest of all persons connected with the telephone industry, "Rural and Farm Telephone Development."

Following Mr. Harrison, L. X. Blantz, general construction supervisor, and G. A. Pullen, plant supervisor, of the C. and P. Telephone Company, Richmond, Virginia, gave a very interesting demonstration and analysis of "The Effects of Lightning on Telephone Wires."

A banquet and dance concluded the two-day meeting of the Virginia Association, and the main feature of the banquet was the address of Francis X. Welch, managing editor of Public Utilities Fortnightly in Washington. Another feature of the banquet was the presentation of a silver tray by Kelley McNish to out-going President J. P. Borden.

Conducted by the
Observer and his Gang

# THE Observation Tower

***If you have observations or even a friendly bit of argument suitable for use in this column, you are invited to send them along, which automatically makes you a member of the Gang. You will be anonymous—no names of telephone people or telephone companies are used in this column. Address "The Observer," in care of TELEPHONE ENGINEER AND MANAGEMENT.***

### *Looking at the Future*

GANG Member No 208, who dotes on statistics and is fond of reading the future, points out to us that most people are unaware of the fact that this country is now experiencing an unusually rapid population growth.

He says statistics indicate that the population of the U.S.A. is now almost 140 million and that it is growing more rapidly than in normal times. There were, he says, almost 11 million births in the country since Pearl Harbor and the birth rate is remaining high.

This Gangster thinks that most of us underestimate the number of new homes that will be started by young couples after demobilization as soon as housing facilities are available. A majority of these new householders, he thinks, will want telephones.

This Gang Member is impressed with the idea that the extremely large use of the telephone during the war years has popularized it more than ever. He thinks that the rate of telephones per 100 of population will be much higher in postwar years than ever before.

We think this Gangster is on the beam and that telephone development in the U. S. A. will from now on surpass any development of the past. Undoubtedly there is going to be plenty of work for telephone companies to do.

### *Read 'Em or Hear 'Em?*

A GANG Member tells us that he rather likes the idea, which was born of necessity, of receiving printed copies of the annual reports of the committees of United States Independent Telephone Association—he thinks that maybe it is better to read these reports than to hear them spoken or read in a convention.

The distribution of these reports in printed form came about this year because the Association could not hold its regular convention. The reports, printed in booklet form, were distributed by the Association to all members.

This Gang Member says he finds several advantages in having the reports in printed form. Says he can take them home, take off his shoes and get comfortable, and read them leisurely—stopping every now and then to ponder some point made or to consider how some suggestion made would apply to his own company. Then he can file the printed booklets along with his other files or data on the subject covered, and refer to them from time to time as needed. This refers particularly, he says, to those reports on what might be called technological subjects and those containing statistical data regarding the telephone business.

We rather liked the opportunity, ourselves, to read all these reports in print. We don't consider the distribution of printed committee reports as a satisfactory substitute for an annual convention, but it may be possible for the Association to combine the two in the future—hold the convention and issue the printed reports, too. That would give us the chance to hear the committee chairman get up and speak his piece; then we could also read it, at our convenience and in a more leisurely manner, later on.

### *New Developments are Here*

A NUMBER of new things of use to telephone companies are now coming into the market. Others will come along gradually. Some, which would otherwise have been available now, have been delayed because of the labor situation and also the still-continuing difficulty of obtaining some kinds of materials and of setting up the manufacturing facilities for making new things.

It should not be overlooked that the manufacturer who puts out something new is always taking some chance on its acceptance by the trade. No matter how good a new thing may be it has to be introduced and sold and no manufacturer can ever be absolutely certain that a new product, regardless of how good it is, will find favor with his customers.

We do not say the following just to please the editor of this magazine, although we think it will please him:

The advertising columns of its trade press are the show windows of an industry. In these columns you will find the new and improved things just as soon as the manufacturer is in position to deliver them to you. There will be

**CHRISTMAS SEALS**

*Protect Your Home from Tuberculosis*

**Christmas Seals finance a nationwide fight against TB, which kills more persons between 15 and 45 than any other disease. You can help make 1946 a healthy year by your purchase of Seals.**

a lot of new things coming out within the next year or so; the up-to-date telephone management will watch the advertising columns carefully—that is where it will find the new things that will help it supply better telephone service more economically.

### *What is Inflation?*

FOR some time we have been searching for a simple illustration that would describe the effects of this thing, inflation, which we now hear so much about. We've heard it described by expert economists—and the more expert they were the more difficult it was to understand what they meant.

The other day we had lunch with a fellow who has made a success of his own business and who should know something about the effects inflation would have on his own and perhaps other kinds of business. So we told him about our search for knowledge.

"I'll give you a very simple illustration of what inflation does," he told us.

"Almost twenty years ago," he said, "my father retired from business with the intention of living on the income from his accumulated savings. He had about one hundred thousand dollars and, to keep his capital safe, he had to invest it in high class securities. Even so, he was able at that time to provide for himself, from first class bonds and high-grade preferred stocks, an income of between fifty-five hundred and six thousand dollars a year, which was sufficient for him and my mother to live on."

"By careful watching of his investments, Father has been able to keep his capital practically intact. He still has around one hundred thousand dollars of value in his securities."

"But," said our friend, "the best he can do now, and be safe in his investments, is to get less than three thousand dollars a year of income from them—and if that isn't inflation, I'll eat my hat!"

"In addition to that," went on our friend, "his income taxes are a great deal higher now than they were twenty years ago when he retired. So the net effect is that Father's one hundred thousand dollars of some twenty years ago has the value, today, for income purposes, of less than the value of fifty thousand dollars at the time he retired."

Well, we're not an economist, and we don't know much about money—never having had any to speak of—but we know that you can't just laugh off a proposition like the foregoing. We know, too, that our dollar seems to buy less and less as the years go on.

We also know—as does every telephone man—that a regulated industry like the telephone business gets it in the neck when inflation comes, because you can't raise rates as fast as expenses can go up. Wise telephone managements, anticipating further price raises in the future, are getting ready, now, to go after rates for their service that are in keeping with the times and with present and prospective costs of rendering the service.

### *When are Times "Normal"?*

GANG Member No. 214 says that every now and then he hears talk or reads something about what the telephone industry does, or what it has done, in normal times. He wants to know what are "normal" times.

Says he can't remember a time since he has been in the telephone business when times were "normal"—unless maybe it was a relatively few years between World War One and the late and unlamented great depression.

During the depression, says this Gangster, all comparisons went by the board. After the depression the industry was busy climbing back to where it had been before then. Shortly after that came the time of defense preparations in this country, then came the war—and certainly none of those were "normal" times.

Now, he points out, we are in the postwar period with all its perplexities and problems, and these, again, are not normal times.

So, he says, he doubts if there are any such times as normal times—at least so far as the telephone industry is concerned.

Well, maybe so. But we don't much care. We have the feeling that an up-and-coming industry and up-and-coming people thrive better and accomplish more when they are up against stiff problems, than when everything is what might be called easy and quiet.

For purposes of statistical comparisons, of course, it is difficult to compare one set of times—such as a depression—with another, such as a war. But that may not be so important, after all. The main point is not what the industry did in the past, but what it is doing now and what it can and will do in the future.

Stop reading if you've heard this one: A man met a friend in front of a church, while the church chimes were pealing loudly. "Aren't those chimes wonderful?" said the man to his friend. "Such harmony; such beauty of tone; such marvelous timing of the chimes; such heavenly music . . . ."

"You'll have to talk louder," said the friend, cupping his hand behind an ear. "I can't hear you on account of them darn bells!"

Now, dear, all we need is a telephone!

# NOISE and CROSSTALK due to Longitudinal Unbalances

By EDWARD J. WALTERS

IN attempting to run down noise and crosstalk in metallic telephone circuits we must not overlook what is known as the *longitudinal circuit*. This consists of the several telephone wires of a metallic circuit and the ground. In the normal metallic telephone circuit the voice currents, with which we are concerned, flow in opposite directions in the two wires of the telephone circuit (or in the two pairs of a phantom group). The longitudinal currents, resulting from inductive interference and crosstalk, flow in the same direction in the two wires of a telephone circuit (or in the two pairs of a phantom circuit) and return via the ground. If the noise and crosstalk currents which flow in the longitudinal circuit are to be kept out of the metallic circuit then the several wires of the metallic circuit must be kept well balanced.

Metallic telephone circuits usually have induced in them, due to paralleling power circuits or other telephone lines, voltages which have the same polarity and approximately the same magnitude on the two sides of the metallic circuit. These longitudinally induced currents and voltages are of approximately the same magnitude due to the fact that the two wires are close together. The frequent transposition of telephone circuits insures still further that the longitudinal voltages are kept balanced. This point is shown by Fig. 1.

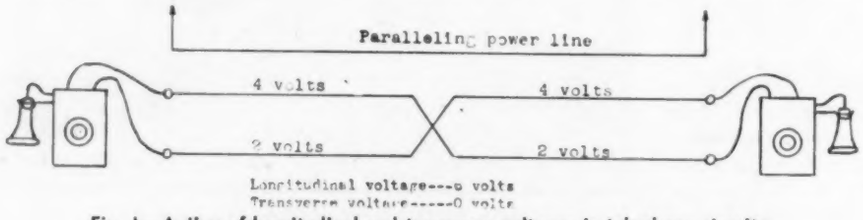



**Fig. 1—Action of longitudinal and transverse voltages in telephone circuits.**

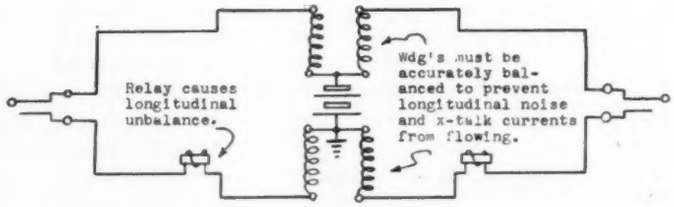

Relay causes longitudinal unbalance.
Wdg's must be accurately balanced to prevent longitudinal noise and x-talk currents from flowing.

**Fig. 2—Repeating coil type common battery coil circuit.**

These longitudinal voltages and currents will not create noise or crosstalk if the series and shunt impedances of the several wires are kept equal. Any unbalances, which may occur in the line wires in the central office cord circuit or in the subscriber's telephone and which tend to unbalance the symmetry of the impedance relationship, will be effective in causing noise or crosstalk.

From this it can be seen that a telephone line may be very accurately transposed yet it will have a high noise level if impedance irregularities occur at any of the several points mentioned. The following paragraphs discuss the various types of unbalances that may, when combined with high induced longitudinal voltages, result in noise or crosstalk which is of a type often difficult to locate.

### *Unbalance in Cord Circuits*

THE cord circuit of a modern switchboard is designed to have a very accurate longitudinal balance. Some of the earlier and now obsolete boards are cord circuits which are not so accurately balanced; hence are a common source of noise, particularly when long parallels with rural power lines are involved. The cord circuit of a common battery office has the function of feeding battery to the two connected subscribers' lines. The battery is grounded; hence, must be placed at the electrical midpoint of the line, otherwise there will be an unbalance in the longitudinal circuit and noise

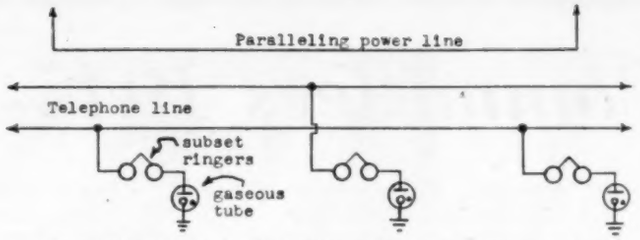



Fig. 3 — Use of gaseous type relays to isolate longitudinal path to ground.

Note-Tube offers high impedance to low voltages but relatively low impedance to signalling voltages.

or crosstalk currents will flow. In the repeating coil type of cord circuit for example, the battery current is fed into the electrical midpoint of the several repeating coil windings as shown in Fig. 2. If these windings are not accurately balanced, which is of course a factory design problem, the ground will not be at the electrical midpoint of the circuit and may be effective in causing noise and crosstalk. Old obsolete type repeating coils are less accurately wound than the newer type and are an occasional source of noise. The same requirements exist in connection with cord circuits which employ condensers and impedance coils.

### *Divided Ringing Subsets*

ANOTHER typical and important source of noise on party lines is the connection of the telephone ringers from one side of the line to ground rather than metallically across the two line wires. This results in a direct unbalance of the line and a high longitudinal current flow over one of the two wires. This unbalanced current flow sets up metallic circuit noise which is heard by the listening subscriber. It can be avoided by the use of exceptionally high impedance ringers or gaseous type relays as

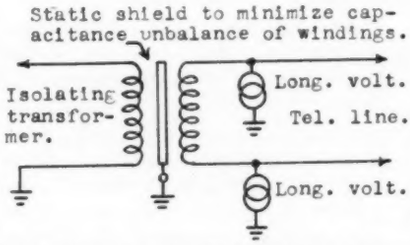
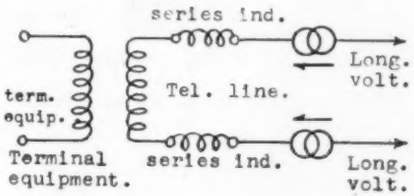



Fig. 4—Use of static shield between transformer windings to minimize capacitance unbalances.

shown in Fig. 3. The use of gaseous relays is restricted to situations where the induced voltages are not sufficient to maintain the gaseous tube in an ionized condition.

### *Shielding to Prevent Longitudinal Unbalance*

IN some central office circuits, particularly those used in connection with repeaters and carrier systems, unbalance in the longitudinal circuit may result from unbalanced capacitances between the various windings of a transformer. Such unbalances are effectively reduced by the use of the proper metallic shield between windings as shown in Fig. 4. The shield is connected to ground and reduces the capacitance coupling.




Note--Series inductance coils reduce magnitude of longitudinal current flowing toward terminal equipment.

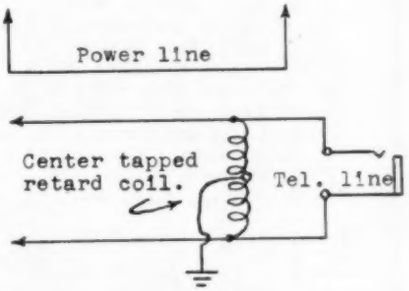
Fig. 5—Use of series choke coils to limit longitudinal noise current flow.

### *Use of Series Choke Coils*

A METHOD employed to some extent on important toll lines for the reduction of longitudinal unbalance currents which might tend to flow because of the characteristics of connected equipment, is to place inductance (choke) coils in the circuit. These are so connected that they offer a high impedance to longitudinal current flow but a very low impedance to the metallic circuit current; hence, they do not effect the normal operation of the line. Choke coils are primarily effective in connection with electromagnetically induced longitudinal voltages. This is shown by Fig. 5.

### *Use of Drainage Coils*

WHEN noise or crosstalk trouble is due to electrostatically induced voltages, relief can often be obtained by the use of drainage coils, as shown in Fig. 6, which act to drain the induced current off to earth. Such coils offer a low impedance to the current being drained and a high impedance across the line, i.e., to the metallic circuit. A drainage coil drains off to earth the current which would otherwise operate on the unbalanced circuit elements. Stating it somewhat differently the drainage coil reduces the unbalanced voltage appearing across circuit elements.




Note-Drainage current flowing through $C_1$ reduces longitudinal voltage on tel. line.

Fig. 6—Use of draining coils to lower longitudinal voltage.

### *Unbalance Effects in The Small Exchange*

MANY small exchanges which have both metallic and grounded lines have operated in the past without serious noise difficulties even though the switchboards have only simple magneto cord circuits with no repeating coils to isolate the answering and calling cords. Rural electrification networks have created a problem in such exchanges. The connection of a normally quiet metallic telephone line which may be paralleled by a power line to a quiet grounded telephone line will result in a high noise level on both lines as long as they are connected. This is due to the longitudinal noise current flow that results from the connection of a grounded (unbalanced) line to a metallic (balanced) line. This can be corrected by rewiring the cord circuits so that a repeating coil conductively isolates the answering and calling cord as shown in Fig. 7. A repeating coil connected in the metallic line at the mainframe will also serve the same purpose.

The next time you have noise and crosstalk troubles do not overlook the *longitudinal circuit* as a likely source of the trouble.

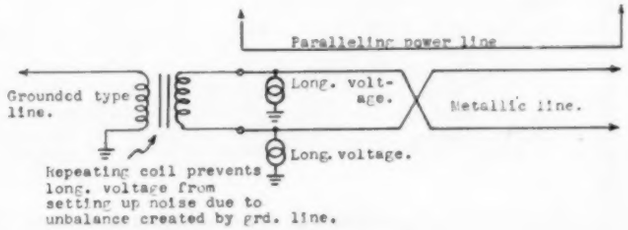

Paralleling power line
Grounded type line.
Long. voltage.
Metallic line.
Long. voltage.
Repeating coil prevents long. voltage from setting up noise due to unbalance created by grd. line.

Fig. 7 — Use of repeating coil in cord circuit to isolate metallic and grounded lines.

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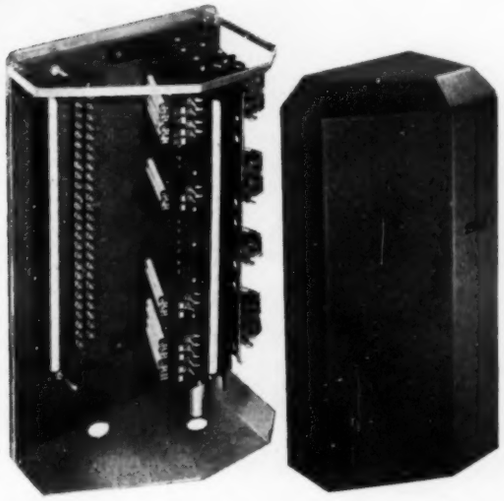
# Type TN

## INTERIOR CABLE TERMINAL



### The TRANS-MOUNT SYSTEM

The Type TN is a part of the Cook Trans-Mount System of Protection and Distribution. The Trans-Mount System is composed of the Type TN Interior Cable Terminal, the Type R Sub-Station Protector, the Type T Main Distributing Frame, the Type S-20 Pole Cable Terminal, the Type U Utility Sub-Station Protector, the Type UA-20 Aerial to Underground Terminal and the Type IT-20 Interior Cable Terminal, all using the Type H Protector Unit.

The Type TN Interior Cable Terminal is a unit of the Trans-Mount System which provides for the termination, protection and distribution of paper wrapped, lead covered cable serving P.B.X. units and unattended exchanges. No silk and cotton switchboard cable tip is required. Type H-20T Dual Gap Protector units provide primary protection with fuses and high potential dischargers and secondary high potential protection after the fuse is blown. These units are installed only as required. Outstanding features of this terminal are the ease with which cross connections may be made and changed under nut and washer terminals and the 100% working accessibility provided by the completely removable cover of the Terminal Vault. Furnished in 26, 51, and 101 pair sizes. Can be furnished with or without cable studs.

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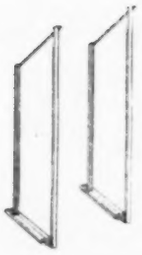
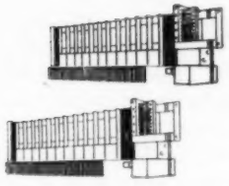
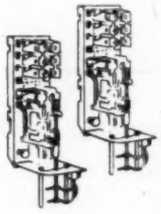


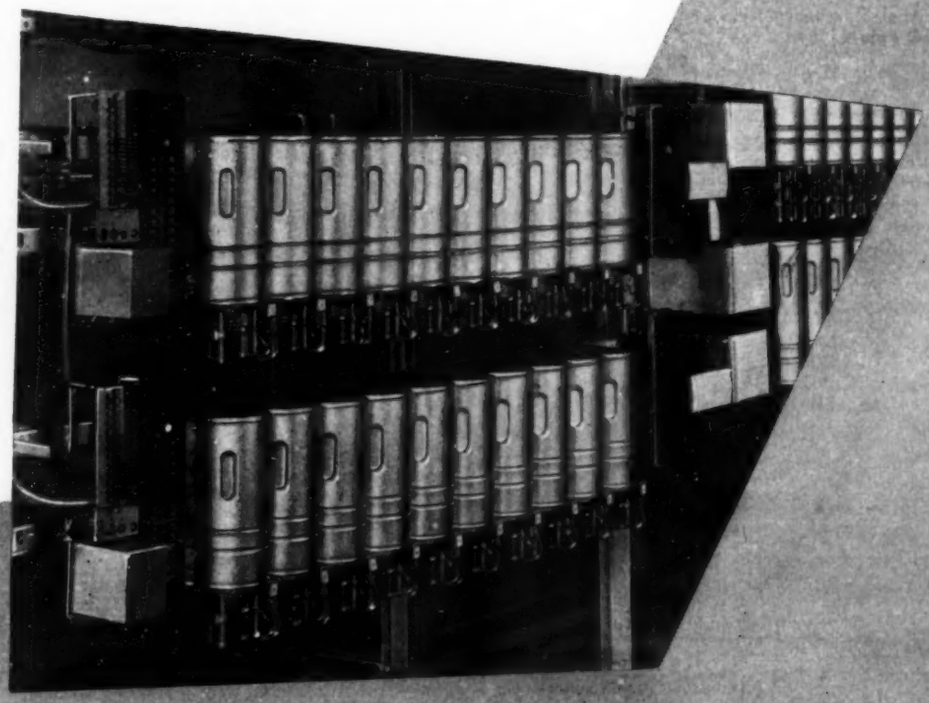
STANDARD FRAMES are rigid, welded-and-bolted steel structures of standardized design, upon which the switches and shelves are easily mounted.



STANDARD SHELVES provide mounting facilities and switch jacks, with all wiring completed to a terminal block at the end of each shelf.



STANDARD SWITCHES each comprise a complete switch mechanism with associated relays—wired, and with wiring terminated on a "jack" on the base.



# Telephone Engineer's RADIO COURSE FOR TELEPHONE MEN

## Chapter 8---Section 2

# Field of Use of Various Bands

By B. C. BURDEN
Technical Consultant
Lincoln, Nebraska
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BEFORE we continue with a discussion of basic radio principles as applied to the telephone field, it might be well to become oriented with respect to those frequency bands which have been allocated for use in the telephone field. At extensive hearings conducted in 1944 the Federal Communications Commission heard testimony from various interests throughout the country regarding the need for radio channels for specific applications. A vast amount of data was collected and in May of 1945 the Commission rendered a decision as to the frequencies which would be allocated to the various interests that had shown a need. The frequencies (with one exception) which are to be made available for assignment in the telephone field are all above 30 megacycles. Table No. 1 shows the allocations made for telephone field applications. The frequencies below 30 megacycles which may, under certain conditions be made available, are in the range of 2000 to 7000 kilocycles. They will be assigned for special emergency service only when the higher frequencies are not satisfactory. (See Note 1, Table 1.)

### *Frequencies Above 30 Megacycles*

IN the consideration of the frequencies above 30 megacycles which have been allocated for telephone purposes it should be noted that the *special emergency* and the *general highway mobile* channels are to be assigned largely in the range below 100 megacycles. Some of these frequencies are subject to *sporadic E layer reflection effects.* However, at the low powers that would normally be employed for telephone field applications it is not anticipated that difficulty will be experienced from sporadic E effects.

*Rural subscriber short haul toll* and *urban common carrier mobile* operating in the range of 152 to 160 megacycles should be relatively free from long distance reflection effects as these frequencies operate on a near line-of-sight basis which would mean that the transmitting range will be restricted to shorter distances than at frequencies in the vicinity of 30 to 40 megacycles.

It will be noted that the long haul toll frequencies are all in the range above 1000 megacycles. At these higher frequencies the techniques become somewhat more involved and the equipment more special than for radio services operating on the frequencies between 30 and 175 megacycles. Much experimental work will be required to make the best of these higher frequencies. They are

**Table No. 1—*Characteristics of Frequency Bands Allocated for Telephone Field***

| Telephone Application | Half Wave Antenna Dimensions Average | Characteristic of Band | Channel Width (KC) | Frequency Bands (MC) |
|---|---|---|---|---|
| Special Emergency (see note 1) | 13½ ft. (35 mc) | Useful for distances up to 30 to 50 miles depending on power used | 40 | (30.5 - 32.0)<br>(33.0 - 34.0)<br>(35.0 - 36.0)<br>(37.0 - 38.0)<br>(39.0 - 40.0)<br>(72.0 - 76.0) |
| Rural Subscriber Short Haul Toll Urban Common Carrier Mobile | 3 ft. (157 mc) | Useful for near line of sight distances up to 20 miles (or less) | 60 | (152.0 - 162.0) |
| General Highway Common Carrier Mobile | 11 ft. (43 mc) | Useful for distances up to 30 to 50 miles depending on power used. | 40 | (30.3 - 32.0)<br>(33.0 - 34.0)<br>(35.0 - 36.0)<br>(37.0 - 38.0)<br>(39.0 - 40.0)<br>(42.0 - 44.0) |
| Long Haul Toll (Relay) | 0.0935 ft. (5000 mc) | Useful for line of sight transmission only | Not specified | (1225 - 1325)<br>(1900 - 2300)<br>(3900 - 4550)<br>(5750 - 7050)<br>(10500 - 13000)<br>(16000 - 18000)<br>(26000 - 30000) |

Note 1—The F.C.C. have indicated a willingness to make available a few channels in the low frequency band (2000 - 7000 KC) for special emergency service where the higher frequencies are not satisfactory and when a proper showing of need is made. Presently used special emergency transmitters operate on frequencies of 2726 and 3190 kilocycles.

characterized by unusually small antenna structures and the ease with which the energy of a radio channel can be concentrated in a narrow beam and directed to a specific receiving point. It is these ultra high and super high frequencies that have played such an important part in radar, in the proximity fuse and in other spectacular wartime developments.

### *Need Must Be Shown*

ALTHOUGH *rural subscribers* and *short haul toll* services are contemplated in the frequency bands allocated for use in the telephone field, the Federal Communications Commission has not yet formally recognized these services and it is necessary that operating telephone companies seeking a license to use radio for these services furnish evidence to the Commission that the rendering of rural or short haul toll service by means of radio channels is in the public interest, convenience and necessity.

### *Procedure in Obtaining An FCC License*

TELEPHONE companies contemplating the use of radio as a supplement to wire lines must obtain approval of the Federal Communications Commission. This is accomplished through the filing of an application for a *radio station construction permit.* The application must give full information as to the nature of the service to be rendered, the type of transmitting equipment to be used, proximity of the airport to the transmitter and a host of other items.

Fig. 116 shows the cover page of the FCC construction application. The application consists of eight pages. After receiving the application the Commission may designate it for public hearings as a means of determining whether or not the service, if established, will meet statutory requirements for public interest, convenience and necessity.

In addition to a *station license* a special *operator's license* is required. As yet no rules and regulations have been adopted by the Commission to cover *rural subscriber* and the *short distance toll* telephone service so at this time we are unable to report as to just what the requirements may be with respect to an operator's license.

### *List of Available FCC Data*

OPERATING companies contemplating the use of radio will find the following list of printed items of pertinent interest.

1.—Part 1, Rules of Practice and Procedure (FCC).
2.—Part 2, General Rules and Regulations (FCC).

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Budget Bureau No. 33-R042.1. Approval expires 3-31-45.

*File No.* .....

*Call Letters* .....

UNITED STATES OF AMERICA

FEDERAL COMMUNICATIONS COMMISSION

**APPLICATION FOR NEW OR MODIFIED RADIO STATION CONSTRUCTION PERMIT** [1]

(OTHER THAN BROADCASTING)

*Nature of service* ..... *Class of station* .....

(Space above this line for use of Federal Communications Commission)

Submit in duplicate direct to the Federal Communications Commission, Washington, D. C. Swear to one copy only. (If for an Alaskan station, submit in triplicate to Inspector in Charge, Seattle, Wash.)

Before this application is submitted, applicant should refer to the Rules and Regulations of the Commission, which may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C.

TO THE FEDERAL COMMUNICATIONS COMMISSION:

1. Name of applicant ..... (Must comply with footnote [2])
2. Post-office address: Number and street .....

   City ..... State .....
3. This application is for:

   (a) A new station ☐

   (b) Make changes in existing station ☐ File No. ..... (Of current license) Call letters .....

   (c) Modification of valid construction permit ☐ File No. ..... (Of construction permit) Call letters .....

   If (b) or (c) has been checked, indicate nature of proposed construction:

   (1) Replace transmitter ☐ (4) Change in location ☐

   (2) Additional transmitter ☐ (5) Change in antenna system ☐

   (3) Increase in power ☐ (6) Other changes (specify) ☐

   .....

   .....
4. What is applicant's principal business? .....
5. State whether applicant is an individual, partnership, association, or corporation .....
6. If applicant is an individual or partnership, respond to the following inquiries: (If applicant is a partnership show the following information for each member of the partnership.)

   (a) Is applicant a citizen of the United States? .....

   (b) If citizenship is claimed by reason of birth, state date and place of birth .....

   .....

   (c) If citizenship is claimed by reason of naturalization of applicant, state the date and place of birth, the date and place of issuance of final certificate of naturalization, the certificate number, and court authorizing the issuance of same .....

   .....

   .....

[1] If only additional time for construction is requested, use Form No. 701.

[2] If a corporation, state corporate name; if a partnership, state names of all partners and the name under which the partnership does business; if an unincorporated association, state the name of an executive officer, the office held by him, and the name of the association. If this application involves a station that is now authorized, the name shown herein must correspond exactly with that shown on current authorization.

Fig. 116—Cover page of FCC Construction Application.

3.—Part 5, Rules and Regulations Governing Experimental Radio Services (FCC).

4.—Allocations from 25,000 Kilocycles to 30,000,000 Kilocycles.

Items 1, 2, and 3 may be obtained from the Superintendent of Documents, Government Printing Office in Washington, D. C. Item 4 is available through the FCC in Washington.

### *Status of Telephone Field Use of Radio Channels*

AT the time this is written the status of radio channel use in the telephone field is somewhat as follows:

The Bell System has under design and construction an experimental radio system between New York and Boston. This system will carry long haul toll and one or more television programs. It will operate at frequencies in the range above 1200 megacycles. Initial operation will be on an experimental basis. Towers will be located approximately 30 miles apart and directional beams employed.

Several Independent group companies are actively considering the use of radio channels for rural subscriber and short haul toll use but no installations have as yet been made.

The Bell System is operating several short over-water radio links for rural subscriber and toll purposes. These have been in service for some time and operate at frequencies near 150 megacycles.

Several Bell System companies have applied for licenses to operate (on an experimental basis) general mobile radio telephone service. It is contemplated that this service could be made available on a two-way basis to trucks, busses, barges, trolley cars, elevated trains, switch engines, doctors, etc.

One Bell System company has been granted an experimental license for one land station and twelve portable stations. These are to be installed in company repair trucks and supervisors' cars. The land station is to be connected to the company's general wire telephone network.

(Section 1 of Chapter 9 will appear in the December 1 FORTNIGHTLY TELEPHONE ENGINEER.)

**Examination Questions**

**Section 2—Chapter 8**

1—What is considered the basic antenna?

2—What is the length in feet of an antenna designed to resonate at half the wavelength of the transmitting frequency which is 151 megacycles? (Use equation which gives practical antenna length not theoretical length.)

3—How can an antenna consume power from the transmitting source?

4—What is the resistance of a typical half-wave antenna?

5—Draw a diagram showing the distribution of current and voltage along a half-wave antenna.

6—Explain the difference between the tuned and the untuned types of transmission lines.

7—Compute the surge impedance of two 0.128 mil copper conductors spaced on 8 inch centers.

8—Compute the X and Y values for a transmission line which matches the impedance of a 72 ohm antenna by spreading out near the point where it connects to the antenna. The transmitter frequency is 40 megacycles and the transmission line impedance 600 ohms.

9—What procedure must be followed by a telephone company in obtaining an F.C.C. license?

10—Which frequency would be most useful for point to point communication over a distance of 35 miles—40 megacycles or 152 megacycles?

**Mail all examinations direct to Lincoln Engineering School—Box 931—Lincoln, Nebraska. Include 6c in stamps to cover return mailing costs.**

# LETTERS

from TELEPHONE ENGINEER readers

Dear Sir:

Thought you might find the enclosed United Press dispatches from Australia interesting:

"Canberra, Oct. 8.—A plan for post-office development, the first stage of which will cost about $40,000,000 is outlined in the report of the postmaster general for 1943-1944 just presented to Parliament.

"The first section described urgently needed improvements in postal telecommunications and broadcasting services. About one-third of the money will be spent on new buildings or remodeling present ones. The report mentions that the number of telephones in service on June 30, 1944 was 799,729. With an average of one telephone to every ten persons, Australia still occupies seventh place in the world."

"Canberra, Oct. 11.—It is revealed today that an operational telegraph line that 600 Australians and 400 Americans helped to establish is in existence between Townsville, Queensland and Port Morisby, New Guinea.

"The communication is of the simultaneous two-way high speed variety. Installation of the equipment was completed in May 1944 and the service began in June last year. The Minister for the army, Francis Forde, said that the first step was the lining of Cape York with Townsville with 200 miles of wire which was laid in two months. In the more difficult areas equipment was dropped by planes. The submarine cable from Cape York to New Guinea was about 350 nautical miles long.

"There was no properly equipped cable laying ship in Australian waters capable of carrying out the job, so a 3,000-ton Collier was converted. Depths of 800 fathoms were encountered. The link was made from a point on the Papuan coast and a telegraph station was erected with a land line back to Port Morisby."

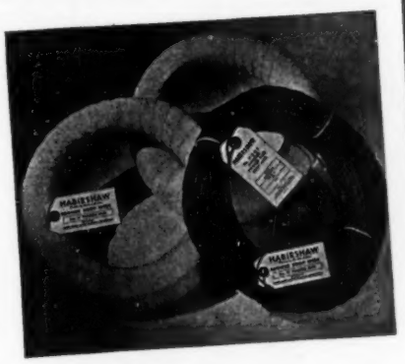
Have been waiting patiently for an article in TELEPHONE ENGINEER about how the Independent telephone companies can secure government surplus communication equipment. We could use all types, especially carrier and teletype apparatus. Could you advise how we find out about the surplus?

Very truly yours,
D. Reginald Tibbetts, Manager
Moraga Community Telephone Assn.
Moraga, California.

*Government surplus property disposal is discussed in this month's column of our Washington correspondent, Roland Davies, and we hope to present further and complete information for you either in the Davies' news columns or as a separate story soon.—Ed.*


STROMBERG-CARLSON
RECOMMENDS—

HABIRSHAW



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High strength bronze conductor . . . expertly blended synthetic rubber insulation . . . soft, unbleached cotton braid, thoroughly saturated to provide a long-lived moisture-resisting covering.

A Quality Product Made by
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MINUTES SAVED
The Job is RIGHT!

DILLON DYNAMOMETERS accurately determine the pound pull on power, transmission, and guy strand. Direct readings save valuable time. Ordinary workmen can easily operate the

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Specifications:

- Mechanism not injured by overload
- ¼" shatterproof safety glass crystal
- Will withstand full shock recoil
- Large, easy-to-read numerals
- Compact (8¼" x 6¼" x 3")
- Light in weight (8 lbs. 4 oz.)
- Galvanized shackles will withstand 25,000 lbs.
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- Readings directly in lbs.
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For Years of Reliable Service,
Insist on the
DILLON DYNAMOMETER

A Precision Instrument for
Precision Line Testing

Accurate
Dependable
Rugged

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## "MASTER" RINGING CONVERTER

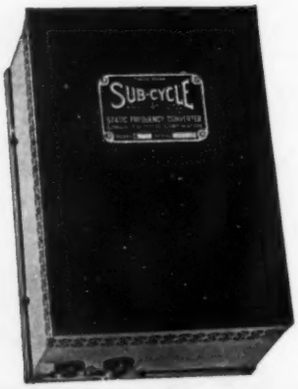
***No Moving Parts . . . Nothing to Adjust***

Sub-Cycle brings to the telephone field an exclusive development in an ***alternating current*** Power Ringing Converter which fully meets the requirements of operating companies.

It produces a powerful ringing current entirely independent of frequency variations in the commercial power supply.

Economical and quiet in operation, it does not interfere with radio and requires no routine maintenance.

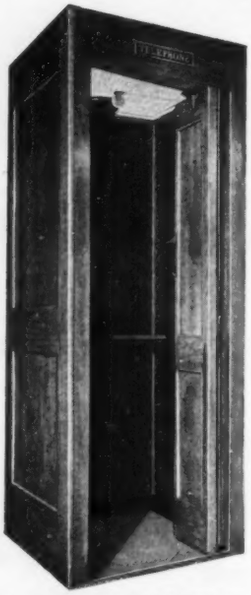
Available in 6 models suitable for loads required by small P.B.X.'s or large central offices.




***Output Capacities 7½ to 45 watts***

*The*

## CHURCHILL



***An ATTRACTIVE***

## TELEPHONE BOOTH

Not only attractive—but comfortable and private—the **CHURCHILL** No. 100 Folding Door Telephone Booth will increase your pay station business.

Operating companies have found the **CHURCHILL** No. 100 Folding Door Telephone Booth a builder of pay station business.

It is constructed as a single unit and equipped with a reinforced back panel for mounting a wall telephone or coin collector.

The **CHURCHILL** Booth is made of selected white oak and is available in light or medium oak in a satin finish.

Included as standard equipment are electric light and automatic electric ventilator.

Overall height is 84¾"; width, 29"; depth, 30½". Shipped knocked down and crated.

Illustrated literature available.

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## Reorganize System

Reorganization of the Lincoln (Ia.) Mutual Telephone Company was discussed at the annual stockholders' meeting held recently. Gene R. Daubendiek, telephone engineer, who was employed by the company to make recommendations regarding the future construction necessary and concerning ways and means to better the service, submitted a report of his survey of the plan and equipment of the company.

Before rebuilding the system can be accomplished, it will be necessary to change the articles of incorporation so that the construction can be adequately financed. According to the officers the physical equipment of the company has reached such a state that something must be done.

## Peoples Tel. Corp. Celebrate Fiftieth Anniversary

The Peoples Telephone Corporation, Butler, Pa., commemorated the fiftieth anniversary of the founding of its Independent telephone company at Butler, Pa., Nov. 7, with a banquet at which between three and four hundred persons were expected to be present. Arthur Black is secretary and general manager of the company and John H. Wright is its president.

Representatives of other telephone companies in Pennsylvania and of the state government and civic organizations in Butler attended the affair. Peoples Telephone Corporation was organized originally to furnish service between the various oil fields and the city of Butler. It has risen from a total of 23 telephones to its present number of 12,600 and a plant investment of more than $2,373,000.

The company was one of the early telephone concerns to install dial equipment and several years before the war representatives of the Danish Government studied the dial exchange practices at the Peoples Telephone Corporation as one of the outstanding small companies with automatic dial service in the country. Over 92% of Peoples Telephone stockholders live in the area served by it and are patrons to its service, while one stockholder. a cable splicer, represents the employees on the board of directors. As another example of its progressive methods, the company last April installed a modern automatic toll switchboard which provides automatic toll service within a certain area of the state.

## Construct Building for New Automatic Exchange

Charles Jessup, manager of the Franklin (Ind.) branch of the United Telephone Company, Inc., recently announced plans for the immediate installation of a new automatic telephone exchange in Trafalgar, Ind.

Repairs have already started on the Franklin-Trafalgar trunk lines, which include replacement of iron wire with copper wire and the addition of one extra circuit. The present Trafalgar magneto exchange will be converted to an automatic exchange for both town and rural telephones. All telephones on the Trafalgar exchange will be replaced with new sets, and the service will be selective ringing in town and rural homes.

A new building will be constructed for the new central office automatic equipment. Trafalgar lines, in town and in country, will be completely rebuilt. Aerial cable will be replaced with underground cable.

The installation of an automatic exchange for the approximately 125 customers in and near Trafalgar will leave Marietta as the only other exchange served through the Franklin office which is not automatic. Dial phones are now in use at Whiteland, Bargersville and Nineveh.

## $100,000 Expansion Program

As soon as necessary equipment can be secured, the Mankato (Minn.) Citizens Telephone company will begin work on its expansion program which will involve expenditure of $100,000. Half of this expenditure will be for installing new switchboard equipment, and the rest, for installation of new cables and expanding the distribution system.

## Progress on Gwynne Bill

The House Judiciary Committee has voted to report favorably the Gwynne statute of limitations bill, H. R. 2788.

As agreed to by the Committee, the bill would (1) require suits to be brought within one year, (2) provide that causes of action already accrued must be brought within six months after the passage of the bill, and (3) provide that no liability shall be predicated in any case on any act done or omitted in good faith in accordance with any administrative regulation, notwithstanding that such regulation may be determined thereafter to be invalid.


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Recommends...

Crapo
HIGH-TENSILE
LINE WIRE

For Long-Span
Low-Cost Lines

Construction costs are reduced to a new low level, maintenance expense is minimized, wherever Crapo HTL-85 and Crapo HTL-135 High-tensile, Low-resistance Line Wires are used. These revolutionary wires, with their superior strength, make possible rural lines with span lengths one and one-half to two and one-half times greater than were practical heretofore.

Crapo HTL-85 permits spans to 225 feet in heavy, 325 feet in medium, and 375 feet in light loading districts; provides stronger spans on existing pole structures.

Crapo HTL-135 makes possible spans of from 350 feet in heavy to 500 feet in light loading districts. Both wires possess superior telephonic transmission qualities.

Crapo HTL-85

Crapo HTL-135

Write for technical data!

DIAMOND C POLES
For Strength

Mfd. by Colfax Lumber & Creosoting Company, Inc.

For the greatest strength in poles, use COLFAX Creosoted Yellow Pine Poles.

The poles are treated full length under pressure with the finest and cleanest obtainable grade No. 1 Creosote Oil, a pure distillate of coal tar, in accordance with AWPA standards.

Each pole, after being carefully graded according to the physical specifications, is treated with eight pounds of creosote, or more if the customer desires.

COLFAX Creosoted Yellow Pine Poles will assure you the lowest annual pole cost obtainable.

*For strength and economy, use*
DIAMOND C
*Creosoted Yellow Pine Poles*

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**HEMINGRAY No. 53**
A single piece transposition insulator which can be used on standard pin.

*Tops In Quality*

. . . . is insured in every Hemingray Insulator. Exacting laboratory control—every batch of glass is checked ***hourly*** with precision instruments.

That's why Hemingray Insulators are still in service after 20, 30—even 50 years. Hemingray Insulators never fail to give dependable, long-life service.

***Insist on Hemingrays for low operating costs.***

## "DEPENDABLE" CROSS-ARMS

***MADE BY:***
***American Cross-Arm, Inc.***

**The best quality cross-arms you can buy.**

**AVAILABLE IN:**

- **Douglas Fir**
- **Creosoted Yellow Pine**
- **Gulf-Red Cypress**

**For sturdy, well-seasoned cross-arms, specify "DEPENDABLE"**

***available for prompt shipment.***

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## Complete $9,000 Improvement Project

A $9,000 improvement project begun in April for the Bellamy Telephone Company, Knoxville, Iowa, by the Stromberg-Carlson Company reached completion in early October. New equipment was installed and the old equipment overhauled to take care of an ever growing volume of business. The work was carried through without an interruption to the service in Knoxville and the rural areas operated by the local exchange. The switchboard, which is divided into toll, city and rural positions, has been completely overhauled and new cords and cables installed in all positions.

An additional toll position has been added which makes it possible to care for a greater number of toll calls simultaneously. A new city position has also been installed which will take care of the greater volume of city hall and also to accommodate the service of eighty new city lines which have been added.

In the equipment installed to care for the additional toll calls, toll recording trunks have been added to facilitate the handling of the toll traffic. Plans called for the installation of an additional toll circuit to Des Moines, at the completion of the other work.

Approximately 1800 subscriber line jacks were replaced with new ones and an improved ringing machine has been installed which will be used to permit the extension of common battery selective ringing service on rural lines.

The telephone exchange equipment is all automatic and in case the power fails, the equipment is then operated by battery service which is constantly maintained in readiness.

## Philco Storage Battery Production Triples Prewar Rate

New recognition of the war production record of the Storage Battery Division of Philco Corporation, Trenton, N. J., has just been received with word of the battery division's sixth Army-Navy "E." This is the 21st "E" conferred on Philco Corporation plants, and only 5% of the nation's industry received the Army-Navy "E."

Philco storage battery production is already largely converted to civilian requirements, and batteries are now being manufactured at three times the prewar rate for the communications industry, Mr. Heinritz, vice president in charge, reports.

## New Switchboard

The Tampico (Ill.) Farmers Mutual Telephone Company recently purchased a new switchboard complete with distributing rack, ringing machine, batteries for standby use in case of interruption of electric power, operators' headsets and chairs. It is a convertible type so that the magneto telephone now in use can be replaced with common battery telephones.

## Western Union To Build Radio Relay Systems

The Western Union Telegraph Company announced, on October 22 in New York, plans for a 62 million dollar radio relay system to link the nation's major cities in the next seven years and eliminate thousands of miles of poles.

Super-high frequency radio beams each will be able to transmit as many as 1,080 messages simultaneously over one beam—many more than wires they will replace, said A. N. Williams, president, and company engineers.

Dr. C. B. Jolliffe, vice president in charge of Radio Corporation of America laboratories, termed it "one of the most significant advances in the communications field in modern times," climaxing more than 20 years of research and development by R. C. A. engineers.

Western Union already has applied for federal communications commission approval to establish experimental radio relay networks between New York and Washington, New York, and Pittsburgh, and a secondary system between New York and Philadelphia.

These networks alone would permit removal of 2,500 miles of pole lines with 54,000 miles of wire, aand 180 miles of aerial and underground cables. Present lines will not be removed until the radio system is in full and successful operation.

An experimental circuit operated between New York and Philadelphia last spring met all tests, Mr. Williams said.

Towers spaced at intervals of about 30 miles will pick up and relay radio beams between cities. They will be located at high points—mostly hills or mountains.

## Retroactive Sale

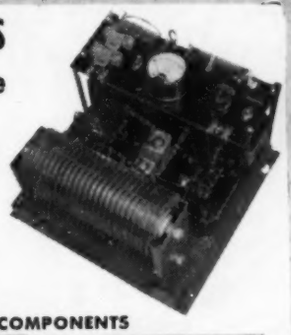
The property of the Wingate (N.C.) Telephone company, owned by Jack J. Perry, was inadvertently purchased by the State School for the Blind, without securing the authority of the North Carolina Utilities Commission as required by law.

After reviewing the situation, the Commission on October 4 approved the sale on the grounds of convenience and necessity.

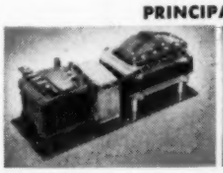

NO MOVING PARTS

Assure Long RectiChargeR Life

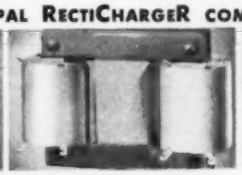
There are no moving parts in a Raytheon RectiChargeR . . . nothing to cause trouble or require constant maintenance. It functions constantly and efficiently, carrying the normal load and keeping the batteries fully charged. A Raytheon RectiChargeR and batteries provide an automatic A.C.-D.C. power system. Write for bulletin.



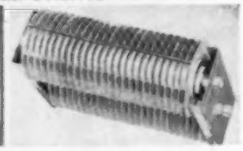
PRINCIPAL RECTICHARGER COMPONENTS



AC Stabilizer—makes the RectiChargeR independent of AC line voltage fluctuations from 95 to 130 volts—a magnetic unit.



DC Stabilizer—automatically insures constant voltage output even if the load varies from full load to zero—a magnetic product.



Dry Disc Rectifying Units—Copper Oxide rectifier elements have no expendable parts, thus assuring long life

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ARMSTRONG'S "Whitall Tatum"

Glass Insulators

107 years of glass-making experience are back of Armstrong's "Whitall Tatum" Glass Insulators—made by the Armstrong Cork Company.

TOUGH!

Armstrong's Glass Insulators withstand all weather conditions. In torrid heat . . . in extreme cold . . . in deluge . . . in blizzard . . . these rugged insulators have proved they can "take it." Tests show that transverse strength exceeds that of supporting pins. Other characteristics of Armstrong's Glass Insulators are:

Accurate dimensions
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Crystal clarity

Conform to—or exceed—A.S.T.M. standards

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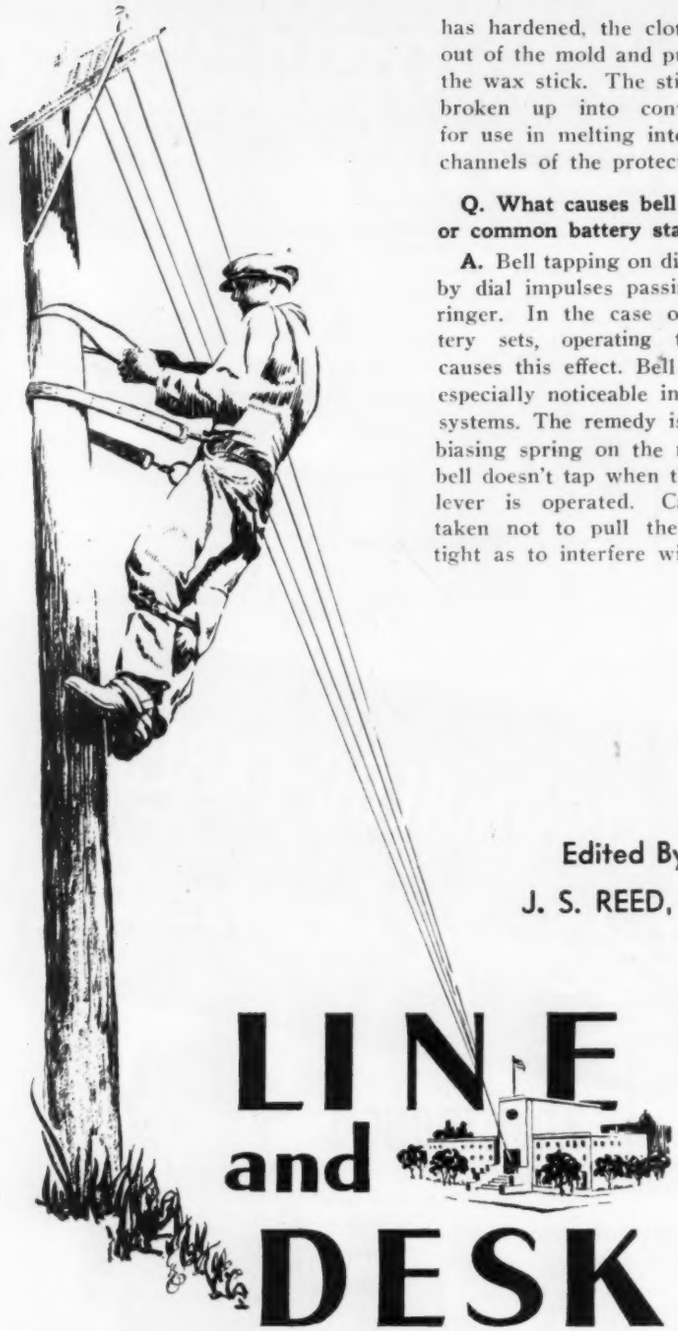

Edited By
J. S. REED, JR.

# LINE and DESK

**Q. You recently published a description of a method of cleaning and repairing substation protectors. What is the proportion of beeswax and sealing wax used for filling the conductor slots in the back of the porcelain base of the protector and how would you prepare this mixture?**

**A.** One part of beeswax to four parts of sealing wax by weight is about right for this mixture. The ingredients are heated together in an enamel-ware vessel and the liquified mixture is poured into a mold made from a long narrow wood trough lined with slicker cloth of the kind used by cable splicers. When the wax has hardened, the cloth can be lifted out of the mold and pulled away from the wax stick. The stick may then be broken up into convenient lengths for use in melting into the conductor channels of the protector base.

**Q. What causes bell tapping at dial or common battery stations?**

**A.** Bell tapping on dial sets is caused by dial impulses passing through the ringer. In the case of common battery sets, operating the hook lever causes this effect. Bell tapping can be especially noticeable in 48-volt battery systems. The remedy is to tighten the biasing spring on the ringer until the bell doesn't tap when the dial or hook lever is operated. Care should be taken not to pull the spring up so tight as to interfere with ringing.

**Q. The REA recently built a power line paralleling our wires, and we now have trouble with inductive noise which is especially bad after rain storms. Our lines are metallic throughout with the wires carried on Knox No. 4 porcelain insulators. What could be the cause of this trouble?**

**A.** From the description of the trouble, it appears that leakage from the wires to ground is the main cause of the noise. The type of insulators you use are designed for insulated wire such as drop wire and will not provide sufficient insulation if used with bare wire. Standard glass insulators of the type known as No. 9 single-groove pony or No. 10 exchange line insulators should be utilized to keep the line leakage at a low figure.

**Q. Occasionally in spinning wire around cable, the wire breaks. How should a break of this nature be repaired without splicing the wire itself?**

**A.** The method that has been used to repair breaks in spinner wire on spun cable is to wrap each end of the broken wire in six close turns around the cable. If too much gap between the ends is left on the cable, additional lashing wire may be used to bridge this gap, the ends of this wire being wrapped around the cable in six close turns, adjacent to, but not covering the turns of the broken wire.

**Q. In installing telephones in subscribers' residences, should the wire be concealed within a partition or wall, or run exposed on the wall?**

**A.** If not too much work is involved by this process, the inside wire should be concealed within the wall especially in new or expensively built residences. If a telephone is to be installed in a second floor room, it is often possible to install an outside station protector at the second floor level and run the wire directly from the protector to the instrument, thus avoiding the necessity for concealing the wire from the basement to the second floor.

**Q. I notice that transposition schemes call for quarter-mile spacings of transposition points. Is this spacing essential in all cases where telephone lines are transposed?**

**A.** The quarter-mile spacing is merely a convenience. In any transposition scheme, the spacings may be smaller or greater provided that they are of as nearly uniform length as possible throughout the scheme. In the case of several lines paralleling a high-voltage power line, it is entirely satisfactory to divide the section involved in the parallel into quarters and cut in transpositions at the quarter points as illustrated in the scheme for a four-wire line in Figure 1.

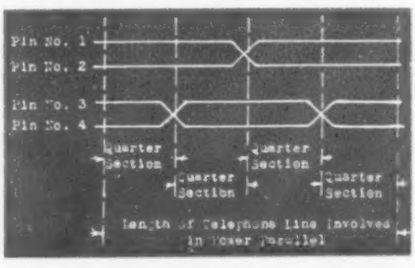


**Fig. 1—Simple transposition scheme for four-wire lead.**

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100% Self-Contained

Gasoline Hammer

**PAVING BREAKERS**

*A One-Man Crew that will SAVE MONEY for You*

Busting Concrete

Drilling Rock

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*Write for Folder No. 8-45*

**SYNTRON CO.**

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**COOK**

**SUB-STATION PROTECTORS**

TYPE O

The Type O single circuit protector, equipped with one pair of fuses and one pair of high potential dischargers are unexcelled for both indoor and outdoor use.

**O-7 with A-7 Wood fuses**

**O-9 with A-9 Lavite fuses**

**O-12 with A-12 Lavite fuses**

**O-44 with A-44 Wood fuses**

**TYPE RO and R1 also available**

**BUCKEYE**

**TELEPHONE & SUPPLY CO.**

**COLUMBUS 6, OHIO**



*A Christmas Gift that will make a hit!*

**The "PHONE EASE"**

**holds the telephone in proper position—freeing both hands for use—**

Here is an ideal Christmas gift for anyone who uses the telephone a lot . . . Snaps on phone—nothing to get out of fix—your customers will love one—$1.50 each.

***Send orders with remittance to***

**TELEPHONE ENGINEER Book Corp.**

***7720 Sheridan Road Chicago 26, Illinois***



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SOUTH CAROLINA
HOTEL WADE HAMPTON ..... Columbia

TEXAS
HOTEL STEPHEN F. AUSTIN ..... Austin
HOTEL EDSON ..... Beaumont
HOTEL BROWNWOOD ..... Brownwood
HOTEL SOUTHERN ..... Brownwood
HOTEL CORTEZ ..... El Paso
HOTEL TEXAS ..... Fort Worth
HOTEL BUCCANEER ..... Galveston
HOTEL GALVEZ ..... Galveston
HOTEL JEAN LaFITTE ..... Galveston
CORONADO COURTS ..... Galveston
JACK TAR COURTS—HOTEL ..... Galveston
MIRAMAR COURTS ..... Galveston
HOTEL CAVALIER ..... Galveston
HOTEL PLAZA ..... Laredo
HOTEL LUBBOCK ..... Lubbock
HOTEL FALLS ..... Marlin
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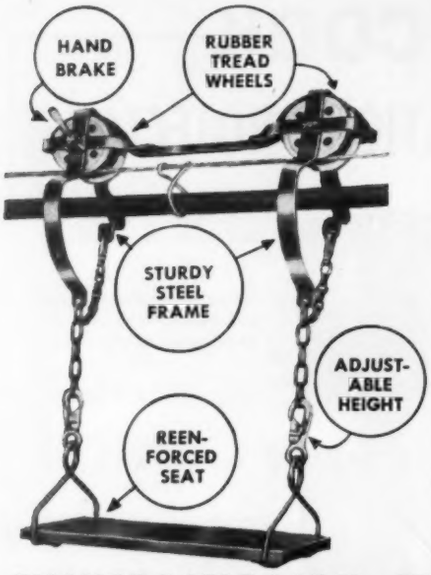
SERVING 88 STATES AND OUR NATION'S CAPITAL




**CHANCE CABLE CAR No. 27**

This Chance Cable Car has been at war with the Signal Corps. It has performed well under the most adverse conditions. Now it is available in quantity for civilian use.

The rubber cored wheels are kept light in weight by the use of Aluminum. The rubber treads ride smoothly over the messenger. The sturdy steel frame and reinforced seat are built to last a lifetime. The seat is detachable and the height adjustable. The hand brake stops the car and holds it anywhere on the messenger.

It was necessary that this product give the best possible performance on its wartime job and the Chance Cable cars you buy today are the same as those furnished to Uncle Sam. They're made to give exceptional service.

A·B·CHANCE CO. · CENTRALIA MISSOURI


## Angus Hibbard Dies

Angus Smith Hibbard, pioneer telephone engineer, died of pneumonia in Chicago, October 21 at the age of 85. He had been, successively, superintendent of the Wisconsin Telephone Co., the first general superintendent of A.T.&T., vice president and general manager of the Chicago Telephone Co., and consulting engineer and adviser to the executive department of the Bell System. Many of the basic devices in telephone appliances were patented by Mr. Hibbard and during his superintendency of A.T.&T. he inaugurated the company's long distance lines and designed the blue bell telephone symbol used throughout the Bell System.

## New Switchboard

A 150-line magneto board with one dial line into Terre Haute (Ind.) for toll service was recently installed by the Rosedale (Ind.) Mutual Telephone company. The board connects to Bridgeton, Mecca and Rockville for local service, serving 385 subscribers on the Rosedale exchange and 120 from Bridgeton.

## Dever Again With Copperweld

Lt. Harry C. Dever

Harry C. Dever is back with Copperweld Steel's Glassport, Pa., division after three years in the Navy. Mr. Dever is in charge of the Atlanta office covering Georgia, Florida, South Carolina and North Carolina.

## Poland to Reestablish Communications 5-7 Years

Poland hopes to reestablish 60 percent of its prewar communications system, both domestic and international, in the next five to seven years. The Nazis virtually obliterated all of the Polish radio stations and telephone and telegraph wire lines. It is understood that only spans of a mile or less of the telephone wire system were left untouched.

In radiocommunications alone, Poland is planning the installation of 15 transmitters, the largest of which for communications with the United States is to have power of 200 kw. Six of these transmitters are to be used for maritime radio service on the Baltic sea and five will be for domestic and inter-European radiotelephone and radiotelegraph service. In addition, the Polish authorities in Washington estimate that at least 31 portable transmitters with their own power supply will be needed and for the international and inter-European and domestic radiocommunications, a minimum of 12 high quality receivers. For telephone service within Poland, a large amount of central office equipment is needed as well as outside plant, wire, cable and other materials, it is understood.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Rainier brackets are sturdy and long lived. They're made of the best oak to be found for the purpose, carefully inspected for defects and possible weaknesses before delivery. With Rainier brackets you are, truly "bracketed with the best"—and it's a nice comfortable feeling you have.

Next time you're replacing brackets—or have new construction—let Rainier carry the load for you. You'll find maintenance costs less.

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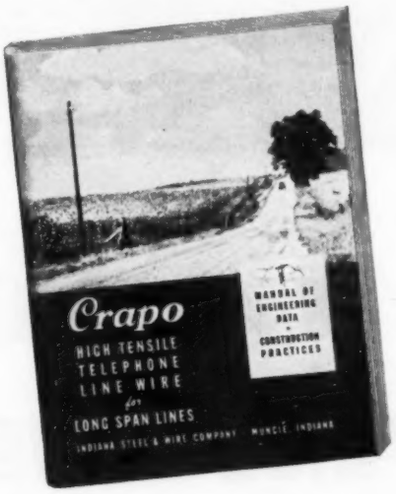
## Free Booklet on Line Construction

"Crapo High Tensile Telephone Line Wire for Long Span Lines" is the title of a new 40-page illustrated manual just released by Indiana Steel & Wire Company and available to all readers.

The content of this manual has been prepared to assist operating companies in their plans of extending and improving rural service. It includes data pertaining to the physical and electrical characteristics of both Crapo HTL-135 and Crapo HTL-85 Line Wire; construction practices; tables of stringing sags and tensions; guying, metalizing and transposition, river crossings, etc.




New illustrated manual of timely interest for present expansion programs.

Copies of this manual may be had by postcard request to Indiana Steel & Wire Company, 700 South Council Street, Muncie, Indiana or to one of their distributors of Crapo Galvanized Products. Please just ask for the free booklet mentioned in TELEPHONE ENGINEER.

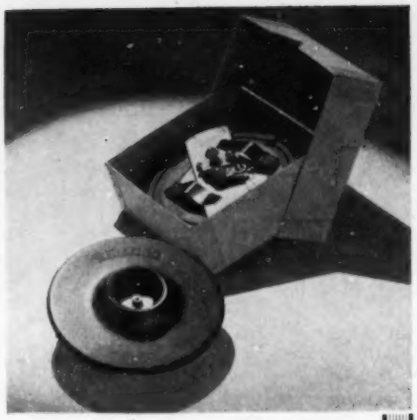
## Little Communications Surplus Sold Dutch East Indies

The sale of $20,000,000 of surplus United States Army supplies to the Government of the Netherlands East Indies contained only a small amount of communications equipment, according to General A. J. Browning, who negotiated the sale for the Army since the Foreign Liquidation Commissioner had not yet established an office there.

General Browning, who recently returned to this country from the Pacific, said that the Java communications system had not been damaged extensively. He related the Dutch told him that they had only 60 miles of telephone cable in all Java and could not use much of this type of surplus. Surplus communications equipment sold to the N. E. I. included 30 radio receiver sets at $300 each, one small sending station, one new and one used radio transmitter (SCR-180) of about 150-mile range, 10,000 feet of telephone wire and 300 hand telephones as well as various other smaller amounts of teletypewriters, etc.

## Bill to Stimulate Use of Radio by Railroads

With the sponsorship of Chairman Wheeler of the Senate Interstate Commerce Committee which greatly assures Senate enactment, a bill was introduced November 1 by the Montana Senator which would give the Interstate Commerce Commission the right to order railroads to install wire telephone or telegraph and radio communications systems. The Senate Interstate Commerce Committee to which the measure (S. 1537) was referred, however, is not expected to consider the bill until early next year after the Thanksgiving recess and at that time hearings probably will be held.

***Transmitters Need Repairing Oftener***

The war years have tended to increase the use of telephones. The oftener a transmitter is used the faster the carbon in it wears round and "burns."

So don't be surprised if you have had to replace more transmitters than usual. Just gather up another batch and send them to Suttle for dependable recharging.

**DEPEND ON SUTTLE**

**LEADING TELEPHONE COMPANIES STANDARDIZE ON**

**PENTA POLES**

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**FULL-LENGTH TREATED NORTHERN WHITE CEDAR**

**P&H Penta treatment is non-conductive and non-corrosive**

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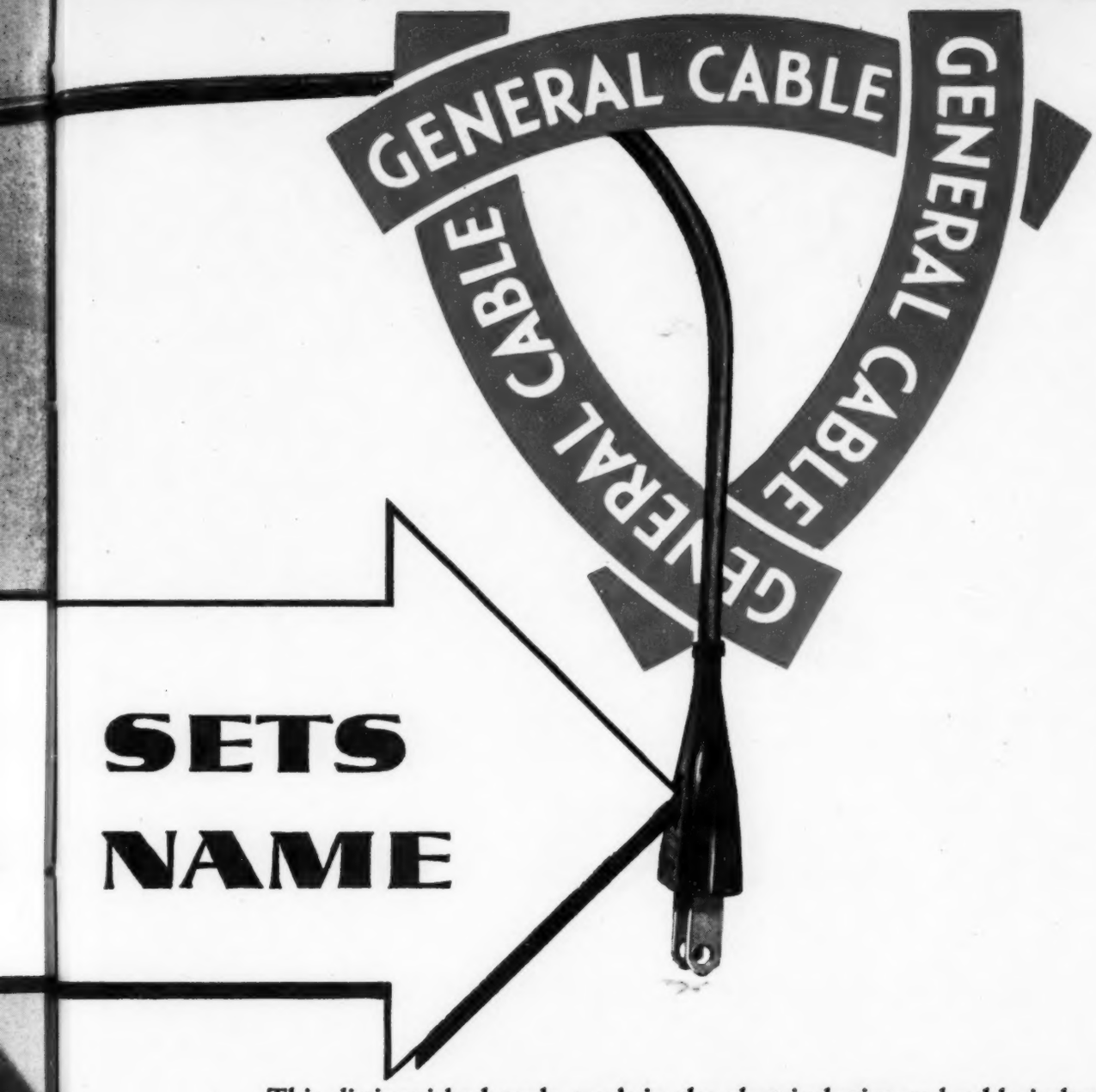


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**General Cable research and advanced engineering, plus expanded facilities and war-developed techniques have been adapted to the production of cords and sets that represent entirely new standards of quality and value.**

**Whatever your requirements may be, General Cable is now ready to serve you with a complete line of quality cords and cord sets.**

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# Personalities

**Arthur O. Black,** general manager, and **John H. Wright,** president, of the Peoples Telephone Corp., Butler, Penn. were honored last week when a golden anniversary of that exchange was held.

•

**Milt Stewart** of the Standard Telephone Company of Cornelia, Georgia, recently reported to the Georgia Telephone Association some hints for inviting telephone booths. Mr. Stewart suggested a little ivory paint for the inside of drab and worn booths, a pad of paper attached to the writing shelf by small machine bolts to prepare for doodlers, and for hot weather especially, a ventilator.

•

**Hunter L. Gary,** Chicago, has been reelected a director of the Missouri, Kansas & Texas (Katy) Railroad by the board of directors' meeting in New York, October 23.

•

**H. B. Crandell,** of Princeton, Ill., is the new president of the Red River Valley Telephone Company Buxton, N. D.; **E. E. Patterson** of Chicago is vice president; **E. N. Hegge** of Hatton, N. D., secretary and **Mrs. Mabel Anderson** of Northwood, N. D., treasurer. Mr. Crandell's associates, who bought the company with him, own and operate Independent exchanges in Illinois, Florida and Minnesota.

•

**Major Ralph G. Scofield,** former engineer for the New York Telephone Co., has been assigned as officer-in-charge of the War Department Signal Center in Washington, succeeding **Lieut Col. W. S. Sparks,** recently appointed traffic manager for RCA Communications. He had been serving as assistant officer-in-charge of the War Department Signal Center since March, 1944.

**William A. Kern,** traffic superintendent of the Rochester Telephone Corporation, and **Donald H. Campbell,**

D. H. Campbell W. A. Kern

plant superintendent, have been elected vice presidents of Rochester (N.Y.) Tel. Corp. The announcement was made by **John P. Boylan,** president.

•

**Mark R. Sullivan** was granted authority by the FCC October 31 to hold the positions of president and director in the Chesapeake & Potomac Telephone Companies of Washington, Baltimore City, Virginia and West Virginia.

•

Major General **Frank E. Stoner,** Chief of the Signal Corps Army Communications Service, was presented in a ceremony at the Pentagon October 31 with the Distinguished Service Medal for "extraordinary leadership" in directing the expansion and operation of "the greatest worldwide communications system ever known."

•

USITA Executive Vice President **Clyde S. Bailey,** was a speaker on the program of the Virginia Association at its annual meeting October 25-26 at Roanoke.

•

**Theodore F. Smith,** president of Oliver Iron & Steel Corporation, is the new chairman of the board of directors of the National Safety Council and will serve for one year.

**Mrs. Temperance Gray** has resigned from United Telephone Company, Kansas City, Missouri after 33 years' service.

•

**Cliff C. Pearce** of Farmers' Tel. Co., Riceville, Iowa, reports that the October 25 meeting of the Northeastern Iowa Telephone Group at Jesup, Iowa, was one of the best, with 49 in attendance and **W. H. Fowler,** president of the Iowa Telephone Association, as one of the speakers. Senator **E. K. Lynes** spoke to the group on current tax problems.

•

**Don W. Walker,** executive secretary of the New York State Telephone Association, reports that their 1946 convention will be held May 22 and 23 at the Hotel Onondaga in Syracuse.

•

**Stanley A. Owens** is the new president of the Virginia Independent Telephone Association. He was elected October 26 at the annual convention in Roanoke when **J. P. Borden** of Virginia Tel. & Tel. Company retired from the presidency of the Virginia Association.

•

**Walter Emery,** assistant to FCC Commissioner **Paul A. Walker,** has published a biography on Mr. Walker.

•

**J. L. Mikesell** is new manager of the Glidden, Iowa exchange for the Central Iowa Telephone Company of Cedar Rapids.

•

**Clyde J. Heath,** general commercial manager of the New England Telephone and Telegraph Co., was elected vice president in charge of studies involving revenue and financial requirements of the company by the board of directors Oct. 16. **John C. Carrather,** of public relations succeeded Mr. Heath as general commercial manager.

**Theodore R. (Ted) McElroy,** president of the McElroy Mfg. Company, manufacturers of telegraph apparatus, Boston, will handle the Hallicrafters line of radio communications equipment, according to a recent announcement by **Wm. J. Halligan,** Hallicrafters president. Mr. McElroy is world famous as champion telegrapher. He holds the speed records for sending and receiving in this field.

•

**R. W. Hedrick,** secretary of the Missouri Telephone Association, found it necessary to send out a circular letter, October 26 postponing the Missouri Telephone Association convention from November 12-13 until the hotel reservation situation eases up.

•

President **George M. Welch** of the Michigan Bell Telephone Company, this week announced the promotion of **Karl F. Oehler** to general solicitor of the company and that of **James Morgan Smith** to general attorney.

•

**Karl W. Mohr,** former district manager of the Iowa Continental Telephone Company, assumed his new responsibilities as general manager of the Monroe County Telephone Company, Sparta, Wisconsin about October 5. He replaced **Harold Bollinger,** who went to Waconia, Minnesota as manager of the Pioneer Telephone Company. Mr. Mohr was formerly with the Commonwealth Telephone Company of Madison in various capacities for many years.

•

**R. S. Griffin,** secretary of the Georgia Telephone Association, reports that the Henry Grady Hotel in Atlanta was decided upon, October 25 by their board of directors for the annual association meeting on November 22 and 23.

•

**Wilbur W. Hetzel,** secretary and treasurer of the Stromberg-Carlson Company, Rochester, N. Y., has been elected a director of the Rochester Control of the Controller's Institute of America.

•

**M. A. Kugler,** manager of the Okaw Commercial Telephone Company, Okawville, Illinois, and **E. S. Slusher,** manager of the Illinois Commercial Telephone Company, Macomb, Illinois, were hosts at the Illinois Telephone Association's group meetings November 6 and 8 at Okawville and Macomb respectively.


# LIGHT

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**Switchboard Room...**
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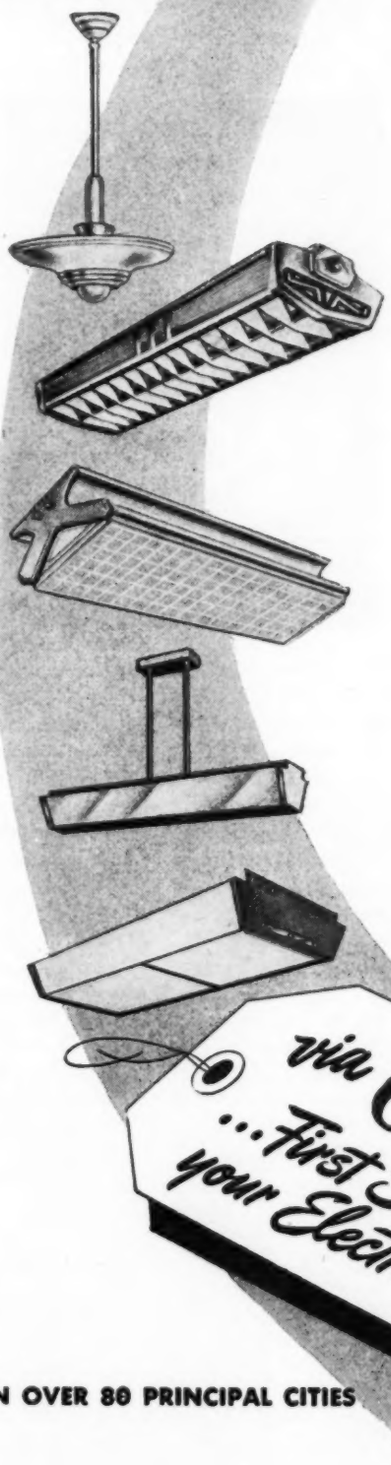

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There's a Graybar Lighting Specialist nearby who'll gladly help to supply your present lighting needs or to plan your relighting program. *Graybar Electric Company, Graybar Building, New York 17, N. Y.* 4575

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*...First Source for all your Electrical Needs*

**IN OVER 80 PRINCIPAL CITIES**

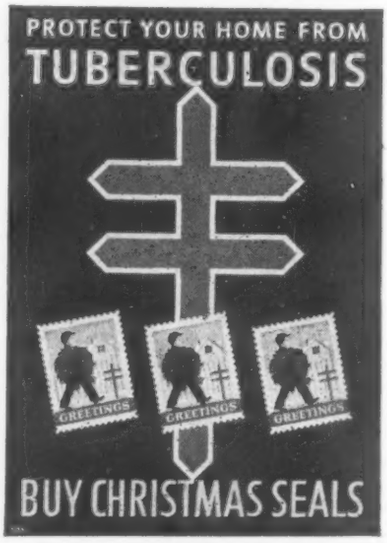
# Highlights of the Communications News

(Continued from page 24)

to 1940, Secretary Anderson asserted the reason for the decline was that private capital had not found rural telephone service an attractive field for investment and because the conditions of service imposed by the telephone companies operated for profit have been beyond the ability of most farmers to meet. His report did admit there had been an improvement in farm telephone service but not as good as 1920. There has been no decrease in rural telephone rates, he emphasized, although urban and long distance rates have gone down. The report **failed to acknowledge** that rural telephone rates are very much lower than urban subscriber rates.

The situation in rural telephones where the number of Independent farmer mutual telephone companies serving rural areas dropped from about 60,000 to less than 50,000 from 1927 to 1937 is in "striking contrast," the Anderson report stated, to the progress of cooperatives in rural electric light and power service. The major factor in accounting for the 260% increase in electric service from 1935 to 1945 is the REA, it said, adding that costs of electric service have been considerably decreased for the same reason. Most of the privately financed rural electric construction has been largely due to REA stimulus, Secretary Anderson maintained, stating that it was the Department's belief that the assistance of government loans as provided in S. 1115 would have **the same success historically in the telephone field as REA has had in the electric field.** The downward trend, the report pointed out, again using the FCC figures of farm telephone service has been most pronounced, in the South Atlantic, East South Central and West South Central states. While the number of farms in these regions has decreased by 6.2%, telephone service has decreased 55.6%.

The S. 1115 bill provides a lending program only with all loans self-liquidating in a period not to exceed 35 years at 1¾% per annum which is identical with the REA Act of 1936. "It may be reasonably assumed," Secretary Anderson said in the report, "that loans will be made in the light of developing experience and sound fiscal policies which have characterized the REA. The character and scope of the program would automatically be adjusted to developing rural demand consistent with the sound principles of financing and business operation." (It will be noted that the Poage bill, proposing the same plan, has never seen the light of day in consideration by the House Interstate Commerce Committee.)




### *FCC Commissioner Walker To Talk to NARUC*

**THE highpoint of the annual convention of the National Association of Railroad and Utilities Commissioners at Miami during the first week in December will come at the Wednesday afternoon (Dec.) session in the address by FCC Commissioner Paul A. Walker on "Future of Telecommunications as a Result of Improvements Made During the War" and the report of the special committee cooperating with the Federal Communications Commission in studies of telephone regulatory problems by Committee Chairman H. Lester Hooker, who heads the Virginia Corporation Commission.**

During the first day and a half, Dec. 4 and 5, there will be little of interest for the telephone industry as transportation and the natural gas investigation will be the topics of discussion, together with the usual opening session of welcoming addresses by Governor Caldwell of Florida, the Miami Beach mayor and Chairman Matthews of the Florida Commission. The only report of industry interest during the first one and a half days will be that on the excess profits tax by Commissioner J. F. Craemer of California.

On Dec. 6, the morning session will be quite significant in projecting the views of state regulatory commissions on the postwar rate base and fair rate of return. Judge John E. Benton, advisory counsel of the NARUC, will be the discussion leader on "What is the Measure of the Rate Base?" and "What is the Measure of a Fair Return Thereon?" Connecticut Chairman Clyde O. Fisher will lead the discussion on "Some Aspects of the Rate Base, with Incidental Reference to the Rate of Return." In the afternoon session, when the election of officers will occur, Congressman Hatton W. Sumners, chairman of the House Judiciary Committee, will give an address on "The Importance of the Preservation of State Sovereignty." On the final day, Dec. 7, Illinois Commission Chief Accountant Fred Kleinman will give the report of the NARUC accounts-statistics committee and Wisconsin Chief Accountant A. R. Colbert presents the report of the depreciation committee.

### *FCC Orders Probe Into Use of Recording Devices*

A "fact-finding" investigation into the use of recording devices in connection with interstate and foreign message toll telephone service has been ordered by the FCC, with hearings to begin Jan. 10, 1946. In directing the investigation which is to determine what future use, if any, of such equipment should be made, the Commission ordered that all telephone carriers, both Bell System and Independents, subject to the Communications Act would be parties respondent.

**Copies of the order have been served on the United States Independent Telephone Association, the National Association of Railroad and Utilities Commissioners and all State Commissions. In addition, the FCC directed the serving of the order upon eight manufacturers which produce recording devices and which, of course, are not subject to the Commission's jurisdiction—these are the Soundscriber Corporation, Dictaphone Corporation, Thomas A. Edison, Inc., American Type Founders Association, Gray Manufacturing Company, Frank Rieber, Inc., Memovox, Inc., and the Speakophone Corporation.**

The tariff regulations on recording devices of six Bell System companies and one Independent company will be considered by the Commission in the forthcoming inquiry and the provis-

ions in the tariffs on file with the FCC relating to the use of equipment provided by other than the telephone company were a part of the investigation order. These companies were the Bell Telephone Co. of Pennsylvania, Diamond State Telephone Co., Chesapeake & Potomac Telephone Co., C. & P. of Baltimore City, of Virginia and of West Virginia, all Bell System companies; and the Bluefield, W. Va. Telephone Co., the Independent company.

It was emphasized by one of the highest FCC sources that the subject was being approached with an entirely "open mind" by the Commission members and its staff. It was explained by one of the Commissioners who is most prominent in telephone regulation to TELEPHONE ENGINEER that the FCC will endeavor to ascertain what should be done in the case of these devices from the standpoint of subscribers other than the user of the device and the relationships and effects upon Section 605 (Secrecy of Communications) of the Communications Act.

During the war, the Army and Navy and some other government agencies have used such devices while the press on overseas radiotelephone dispatches also has been a user from time to time of such devices in recording dictated news stories. There have been some informal conferences from time to time between the FCC staff members and the telephone companies which are opposed to such devices.

The Commission stated in its order that it will consider the regulations of the telephone companies' tariffs prohibiting use of recording devices, the question as to what action should be taken as to the devices; and the effects of the use of recording devices on the privacy and the quality of telephone service.

Eight specific points were cited in the Commission order for consideration in the investigation as follows:

"(1) The nature and extent of the need and demand for the use of recording devices in connection with interstate and foreign message toll telephone service;

"(2) The extent to which the use of recording devices might impair the privacy and quality of interstate and foreign message toll telephone service;

"(3) Whether suitable devices or methods can be effectuated to indicate to a user of interstate or foreign message toll telephone service or facilities that a recording device is being employed in connection with his use thereof;

"(4) The lawfulness, under the Communications Act of 1934, as amended, of the above-mentioned tariff regulations;

"(5) Whether the Commission should prescribe a tariff regulation governing the use of recording devices in connection with interstate and foreign message toll telephone service, and, if so, the kind of tariff regulation that should be prescribed;

"(6) The relationships, if any, of the use of such recording devices to Section 605 of the Communications Act of 1934;

"(7) Whether any further legislation is necessary with respect to the use of recording devices in connection with telephone service and facilities;

"(8) Whether recording devices are presently being used in connection with interstate and foreign message toll telephone service and facilities in violation of applicable and effective tariffs on file with this Commission."

The FCC also ordered that any person or organization desiring to make any presentation for the record herein shall not later than December 19, 1945, so inform the Commission in writing, giving the names of proposed witnesses and the matters to be covered. Persons desiring to intervene can do so by petition under Section 1.102 of the FCC Rules and Regulations.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DEAD ACCURATE EASY TO USE

Takes out guesswork of "sight and sag", or oscillation wire stringing. Hooked on in a jiffy. Indicates tension in seconds. Measures only 8¼" x 6¼" x 3". Capacities 500 to 20,000 lbs.

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Many other uses where pull, torque, weight or overload are vital factors.

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# RURAL REPORT

The Bell System's pre-war rural expansion and improvement program is being resumed — on a vastly increased scale. In a project like this, farmers want to know what's going on . . . what progress is being made. Telephone advertising tells them. The advertisement on the opposite page is one of a series currently appearing in national farm magazines. It is evidence of the telephone industry's interest in extending and improving rural telephone service.

AN ADVERTISEMENT OF THE BELL TELEPHONE SYSTEM

# A MILLION MORE TELEPHONES IN RURAL HOMES

Plans of the Bell System to extend and improve farm telephone service call for providing a million more families in rural areas with telephones within three to five years after men and materials are again available. This wide-range program will cost about $100,000,000.

It continues and expands a rural program which the Bell Telephone companies had carried on for a number of years, until the war cut down its pace. Since the depression of the mid-1930's, about half a million additional farm telephones have been installed. Nearly 400,000 have been added since 1940.

When Bell Telephone men and women now on leave with the armed forces come back from war-torn lands, one of their big jobs will be to help provide still more and better telephone service for farm families.

BELL TELEPHONE SYSTEM

LISTEN TO "THE TELEPHONE HOUR" EVERY MONDAY EVENING OVER NBC

## Michigan Bell Rate Case Reopens

The petition of the Michigan Bell Telephone Company for a reopening of the investigation into the latter's rates has been granted by the Michigan Public Service Commission and arguments will be heard by the Commission at Detroit, November 27.

In its petition, the Michigan Bell urged the Commission to make another examination into its affairs in the light of the changes from a wartime to a peacetime economy. It cited prospects for higher wage, material and construction costs, upward price trends and tax reforms.

## Prewar Telephone Board

Gerald Preddy, manager of the Exeter (Mo.) Telephone Company has bought a prewar switchboard for this exchange. Mr. Preddy is making additional improvements in the system and is using insulated wire on the local lines.

## Hallicrafters Begin New Plant

Ground has been broken and construction started for the new modern plant the Hallicrafters Company is erecting at Kostner and 5th avenues, Chicago.

The new $600,000 plant will have 141,000 square feet of floor space, enough to permit grouping of most of the firm's activities under one roof.

**At the controls of the steam shovel is Wm. J. Halligan, president of Hallicrafters. Observing is Joseph J. Frendreis, secretary and treasurer.**

Construction will proceed as rapidly as possible, and the company hopes for occupancy by December.

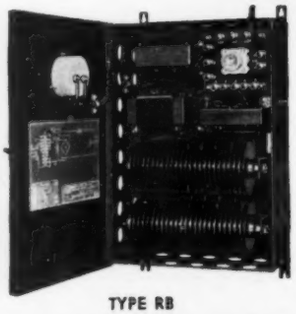
Extensive alterations will be carried out in the present building during the coming months as part of the reconversion program. B. D. Quackenbush, vice president and general manager of the company, estimates that it will be at least a year before the company's postwar program is in full swing. He stated that thereafter the operations of the company would probably be at least double those of the postwar period.

## Rural Company Increases Rates

The Callensburg (Pa) Telephone Company increased its rates in October to $1.75 per month where the company furnishes the telephone and $1.50 where the subscriber provides the telephone. The former rates were $15. and $12.00 per year, respectively.

## Acquires Additional Property

The United Telephone Company of Pennsylvania, Harrisburg, Pa., recently purchased the McClure's Gap Telephone Company, for which United Tel. formerly furnished switching service from United's Carlisle (Pa.) exchange.

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***Capacities of 1 to 12 amperes, from 24 to 48 volts. Other capacities available to meet individual requirements.***

Low in cost! See your jobber, or write direct for full information.

***Write for Circular 443***

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**Is What This Guy Wants!**

This man actually works with Pole Line Hardware. He knows what he wants. He wants it so designed, so made, that it will be easy to handle and will *stay put!* L-M Pole Line Hardware is made that way. It is designed right, finished right, packed right. It is easy to use, and the lineman doesn't have to do the job over, when you give him this hardware. For information write Line Material Co., Milwaukee 1, Wisconsin.

**LM LINE MATERIAL**
**POLE LINE HARDWARE**

## V. E. Chaney Named Executive Vice President of Tel. Bond & Share Co.

Verne E. Chaney, for many years identified in various executive capacities with companies of the Gary Group, has been elected executive vice president of Telephone Bond and Share Company, and has moved from Fort Wayne to make his headquarters at the Gary Group offices in Chicago.

Verne E. Chaney

Mr. Chaney will continue general executive direction of the Telephone Bond and Share and Community companies, and will gradually take over general executive direction of all operating telephone companies in the Gary Group. He will retain his positions as vice president of Theodore Gary And Company and of Gary Services and Investment Company, as well as other official positions he holds with the various operating companies in the Gary Group.

Mr. Chaney's career in the Independent telephone field dates from 1910. After serving three years in the accounting departments of the telephone companies at St. Joseph and Joplin, Missouri, he entered the accounting department of the Theodore Gary Investment Company, Kansas City, remaining there until the first world war, during which he saw active service in France, being a Sergeant in the Artillery Battery of which President Truman was Captain.

Upon his return, Mr. Chaney served for a period with the Texas Telephone Company, and was then again transferred to the parent company, Theodore Gary And Company, Kansas City. In 1925, he was elected treasurer of Diversified Investments, Inc., predecessor of Telephone Bond and Share Company, which now holds investments inIndependent telephone operating properties serving nearly 300,000 stations in 17 states.

During the past twenty years, Mr. Chaney has held various administrative positions in the Telephone Bond and Share system, and its affiliated operating and service companies. He is active in telephone association affairs, has served on the executive committee of the USITA, and is at present 2nd vice president and a member of its board of directors.

## Chinese Order Shanghai Telephone Company Reorganized

The Shanghai Telephone Company, a subsidiary of the I.T.&T., is one of the American companies to be affected by China's new company law, effective in January and which will necessitate the reorganization of all foreign-owned public utilities in Shanghai. The board chairman of the company will have to be Chinese, according to the interpretation of the new law, and the company will have to file yearly business reports, etc., with the Chinese Government.


Can You Get Up An "Ad"?

Everybody seems to know two businesses, his own and the advertising business. Talk to the traffic cop for five minutes and chances are he'll say, "Of course, I don't know anything about advertising but . . ." And then he proceeds to tell you what's wrong with the whole field of public relations.

I guess we're just dumb, but we only know one business, the business of selling and managing TELEPHONE DIRECTORY and TRANSPORTATION ADVERTISING. In that particular line we doff our "Downs" hat to nobody!!! Modest aren't we, but we do feel that over twenty one years experience and the sale and management of more than 25 million dollars worth of advertising entitles us to a hearing when our subject comes up.

Why not get the LOOMIS story before your Directory advertising contract comes up for renewal? Address Wesley H. Loomis, Jr., Pres., 20 West 9th St. Bldg., Kansas City 6, Missouri or Roland T. Beard, Ft. Wayne, Indiana.

Loomis ADVERTISING COMPANY

502 Gettle Bldg., Ft. Wayne 2, Ind.

506 Olive St., St. Louis 1, Mo. 20 West 9th St. Bldg., Kansas City 6, Mo.
6908 Market St., Upper Darby (Phila.) Pa. Omaha Nat'l Bank Bldg., Omaha 2, Neb.

LENZ HAND SET CORDS
LOOK FOR
LENZ
THIS MARK OF QUALITY
REACHING NEW HEIGHTS
LENZ engineers are constantly striving for new heights of perfection in the manufacture of Telephone Cords, Wire and Cable.
For instance: New materials and improved manufacturing methods have resulted in better Hand Set Cords. Longer wearing braids assure greater economy. Stronger tinsel conductors maintain highest transmission efficiency. LENZ type of construction offers greatest flexibility.
Subscriber satisfaction is still important—Specify LENZ. Write today for complete information.
DISTRIBUTORS
LEICH SALES CORP.
427 W. Randolph St.
Chicago 4, Ill.
H. H. VAN LUVEN
307 E. 3rd St.
Los Angeles 13, Calif.
LENZ ELECTRIC MANUFACTURING CO.
1751 N. WESTERN AVE., CHICAGO 47, ILL., U. S. A.
"IN BUSINESS SINCE 1904"


# Telephone Engineer

## HANDBOOK TABLES

**Index—Cable Splicing Data**
**Date — November 15, 1945**

### Lead Sleeve Dimensions for Various Sizes of Telephone Cable (Cont.)

**Table No. 2 (a) Dimensions of Lead Sleeves for Bridge Splices (19 or 22 Ga. Branch Cable Spliced to 19 Ga. Main Cable)**

| Gauge and Pair Size of Main Cable | Pair Size of Branch Cable 15 pr. | 25 pr. | 50 pr. | 100 pr. | 150 pr. | 200 pr. | 300 pr. | 400 pr. |
|---|---|---|---|---|---|---|---|---|
| 19 ga., 25 pr. | | | | | | | | |
| Length of Sleeve | 15 " | 15 " | | | | | | |
| Inside Diameter | 1½" | 1¾" (1)<br>1½" (2) | | | | | | |
| 19 ga., 51 pr. | | | | | | | | |
| Length of Sleeve | 15 " | 17 " | 17 " | | | | | |
| Inside Diameter | 1¾" (1)<br>1½" (2) | 1¾" (1)<br>1½" (2) | 2 " (1)<br>1¾" (2) | | | | | |
| 19 ga., 100 pr. | | | | | | | | |
| Length of Sleeve | 17 " | 17 " | 17 " | 20 " | | | | |
| Inside Diameter | 2 " | 2¼" | 2¼" | 2½" | | | | |
| 19 ga., 150 pr. | | | | | | | | |
| Length of Sleeve | 20 " | 20 " | 20 " | 20 " | 20 " | | | |
| Inside Diameter | 2½" | 2½" | 2¾" (1)<br>2½" (2) | 3 " (1)<br>2¾" (2) | 3 " | | | |
| 19 ga., 200 pr. | | | | | | | | |
| Length of Sleeve | 20 " | 20 " | 20 " | 20 " | 20 " | 20 " | | |
| Inside Diameter | 2¾" | 2¾" | 3 " (1)<br>2¾" (2) | 3½" (1)<br>3 " (2) | 3½" | 3½" | | |
| 19 ga., 300 pr. | | | | | | | | |
| Length of Sleeve | 20 " | 20 " | 20 " | 20 " | 20 " | 20 " | 20 " | |
| Inside Diameter | 3½" | 3½" | 3½" | 4 " (1)<br>3½" (2) | 4 " | 4 " | 4½" (1)<br>4 " (2) | |
| 19 ga., 400 pr. | | | | | | | | |
| Length of Sleeve | 20 " | 20 " | 20 " | 20 " | 22 " | 22 " | 22 " | 22 " |
| Inside Diameter | 4 " | 4 " | 4 " | 4 " (1)<br>3½" (2) | 4½" | 4½" | 4½" | 5 " (1)<br>4½" (2) |

Note (1) For 19 ga. branch cable only.
(2) For 22 ga. branch cable only.

**All of the Navy's big guns are directed by RADAR made by Western Electric**

U. S. Navy Photo

USAAF Photo-Acme

**All bomb-directing RADARS used on B-29's were made by Western Electric**

RADAR made many contributions to Victory both in Europe and in the Pacific. It directed the fire of naval guns—the dropping of bombs through clouds and darkness—detected the approach of enemy planes and ships — spotted submarines — guided night fighter pilots to their unseen targets.

Radar takes scores of weird shapes, each especially developed to do a specific job.

A land-based radar may tip the scales at 70,000 pounds. A compact airborne unit may weigh only 168 pounds.

A simple radar may have 80 vacuum tubes—another as many as 374.

One unit may require 40,000 labor hours to complete—another type only 4600 hours.

Up to the end of the war, Western Electric had furnished more than 56,000 radars of 64 different types, valued at almost $900,000,000.

The basic principles of radar—transmission and reception of high frequency radio waves—have long been familiar to Western Electric through its wide experience in making telephone, radio and other electronic apparatus. So it was natural that this Company was chosen to play a leading role in radar for use on land, aboard ships and in planes.

***Buy Victory Bonds and hold them!***

**Western Electric**

**NATION'S LARGEST SOURCE OF RADAR**

FOR QUICKER EASIER TRIMMING WORK
use SEYMOUR SMITH TOOLS...
TREE TRIMMERS
POLE SAWS
BRUSH CUTTERS
CABLE CUTTERS
JOINTED TEST-PIKE POLES
A line of tools designed for linemen's use that are standard equipment with the world's largest Utility Companies.
Send for folder and prices of this labor saving equipment.
SEYMOUR SMITH & SON, Inc.
901C Main St., OAKVILLE, CONN.

# Use of Nitrogen Gas In Cable Work

(Continued from page 28)

section, the gas should be admitted to the cable at several points about 2½ miles apart.

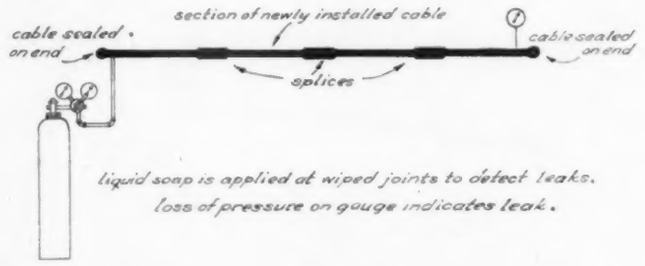

section of newly installed cable
cable sealed on end
cable sealed on end
splices
liquid soap is applied at wiped joints to detect leaks.
loss of pressure on gauge indicates leak.

Fig. 6—Testing sleeves and cables for leaks.

### *Locating Sheath Openings With Gas*

NITROGEN gas is ideally suited for the testing of wiped solder work. It readily detects cracks and blow holes which would ordinarily be overlooked. It is likewise useful in detecting sheath breaks which occur in the placing of new aerial or underground cable and which would otherwise pass unnoticed until a cable is thrown in trouble due to the entrance of moisture.

When nitrogen gas is admitted to a cable, it filters through the core of the cable rather slowly. An appreciable time is required for it to build-up equal pressure throughout a long section. The time required depends on the type of cable and is less with the older loose core cable than with modern tight core cable. On a ten mile section of cable, for example, as much as one or two days may be required before pressure is equalized throughout the section. Because of this retarding effect of the cable core on the flow of gas it is possible to make tests of splices or short cable sections without the necessity of permitting an entire cable section to be placed under equal gas pressure. Fig. 6 shows the setup for testing sleeves or short sections of cable.

### *Use of Temporary Clamp Type Valves*

IN testing sleeves or short sections of cable one or more valves must be installed. Temporary *clamp type valves* are generally used. A hole is drilled through the cable sheath or sleeve, and the valve and clamp assembly placed over this hole. After the tests are completed, those temporary clamps are removed and holes soldered over with seam solder. In some cases small brass plugs are screwed into the hole and soldered over. The use of brass plugs has the advantage of permitting the holes to be immediately closed even though the cable still contains gas under pressure. Otherwise it would be necessary to wait until the gas pressure dropped to zero before the hole could be soldered shut.

ACORN INSULATED WIRE
TODAY TELEPHONE WIRE has to be tough
Many years of specialization in the manufacture of communication wire has built a performance record for Acorn Drop Wire.
ACORN INSULATED WIRE COMPANY, INC.
225 King Street, Brooklyn, N. Y.
LEICH SALES CORP., 427 W. Randolph St., Chicago
LINDSAY SUPPLY CO., 4815 Superior Ave., Cleveland
PREVENT ACCIDENTS! ACORN'S exclusive Carton Packaging for Safety and Better Warehousing.
Drop Wire—Bridle—Interior—Tree—Ground—Switchboard—Pothead—Cal

After a sleeve or short section of cable has been placed under gas pressure, the sleeve or any portion of the sheath suspected as having an opening should be painted with a soap solution to detect sheath openings.

In making tests as just described the low pressure regulator should be so adjusted that the pressure reading does not exceed 20 to 25 pounds at any time. The overall pressure in existing cable sheaths should not be permitted to rise much above ten or twelve pounds at normal temperature (70 degrees). Somewhat higher pressure is of course necessary at the point where gas is being admitted to the cable. When the method just described is used to locate a sheath opening in a section of aerial cable, it is often possible to hear, when walking under the cable lead, the hissing noise made by the gas as it escapes from the sheath opening, particularly where a large sheath opening is involved.

### *Maintenance of Cables Under Gas Pressure*

AS previously stated, most of the toll cables used between cities as well as many toll entrance cables and some trunk cables are now maintained under permanent gas pressure. The procedure usually consists of charging the cable with gas and then disconnecting the charging source. Additional gas is admitted only when necessary to replace the gas lost through leakage. The longer toll cables are divided into *gas sections* usually about ten miles in length. Each section is isolated from the next by means of gas *pressure plugs*. This use of isolated gas sections facilitates the location of sheath openings by means of gas pressure readings. Test valves are located at approximately one mile intervals on the ten mile gas section and in addition three *pressure* contactors are located at equal intervals in the section. The pressure contactors are connected to a special cable pair which sends in an alarm to the nearest office whenever the gas pressure drops below some predetermined value.

The test valves used in connection

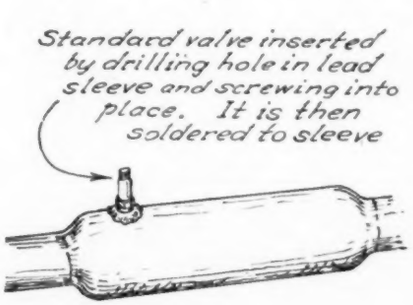



Fig. 6a — Method of placing permanent valve in sleeve.


# Yours for the Asking

## This New Engineering Manual for Long-Span Lines

Pertinent and timely information on how to build long-span, low-cost rural lines of *Crapo* High-Tensile Telephone Line Wire is contained in this new, illustrated Manual. The book is designed especially to assist operating companies in furthering their plans for extending and improving rural service.

The contents include electrical and physical characteristics of both *Crapo* HTL-135 and *Crapo* HTL-85 Line Wire; tables of stringing sags and tensions; recommended construction practices; information on guying, metalicizing and transposition, river crossings, etc.

If you have not received a copy of this manual, be sure to ask for one! Direct your inquiry to your distributor of *Crapo* Galvanized Telephone Wire and Strand, or write us!

***Crapo*** **HTL-135 Telephone Line Wire possesses two and one-half times the strength of standard B. B. wire; makes practicable spans of 350 feet in heavy loading to 500 feet in light loading districts. *Crapo* HTL-85 permits spans of 225 feet in heavy loading, 375 feet in light loading districts.**

**INDIANA STEEL & WIRE COMPANY**
**MUNCIE, INDIANA**

# *Crapo* HIGH-TENSILE TELEPHONE LINE WIRE

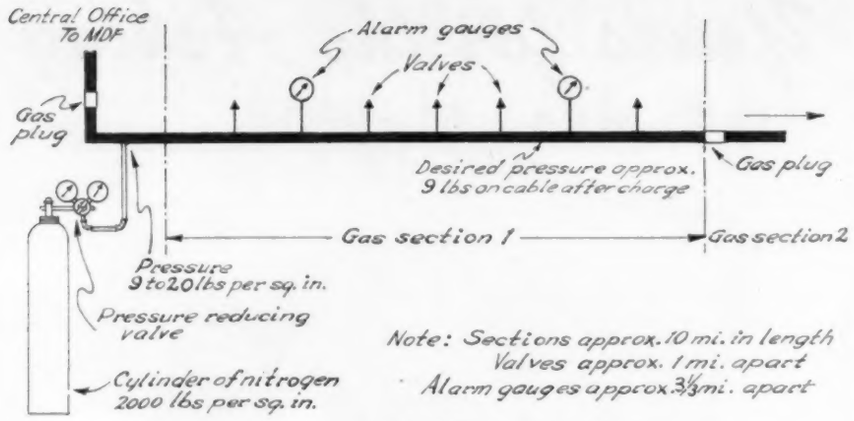



Fig. 7—Maintenance of cable under gas pressure.

with buried tape armored cable are brought up on stub poles. The cableman can readily make pressure readings for the purpose of locating sheath openings at these convenient points. Portable gauges are used for this purpose.

### *Method of Computing Location of Opening*

WHEN a sheath opening occurs in a cable maintained under gas pressure, readings of pressure are taken at test valve points along the gas section from which an alarm has been received. The readings are plotted on graph paper and will show with fair accuracy the approximate location of the leak. A typical example of the use of pressure readings in plotting and locating a sheath opening is shown in Fig. 9. The size of the sheath opening determines the value of the pressure readings which are obtained at valve points on each side of the opening.

### *Drying Out Moisture*

NITROGEN gas is being used successfully to dry out wet cables. This use is particularly valuable in connection with underground or buried cables in which the use of gas for such purposes is particularly advantageous.

Fig. 8—Gauge used in measuring pressure at test valve points.

is of such size as to permit a fair quantity of gas to pass through the wet pairs, prompt drying action can be expected.

### *Conclusions*

IN the opinion of the writer, gas has a definite place in the cable maintenance program in all of the larger Independent operating exchanges. The investment required for the gas, regulator and pressure gauges is small compared to the advantages of this method. However, gas techniques should not be regarded as a substitute for the Wheatstone bridge but rather as a supplementary tool. Gas has particular advantages when a substantial amount of underground buried cable may be involved.

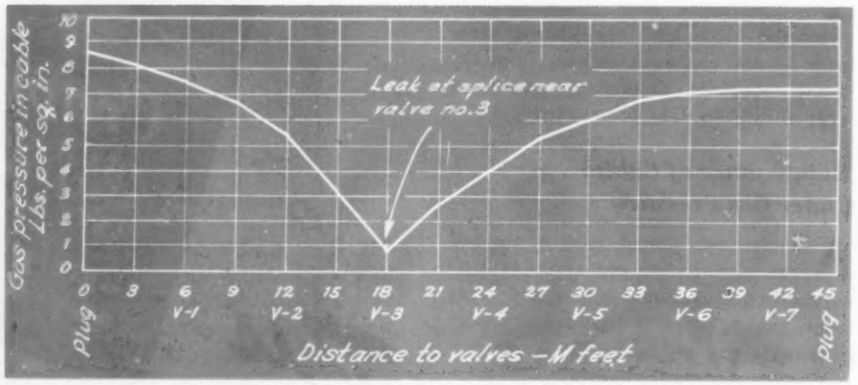



Fig. 9—Method of plotting location of sheath break

Gas can be used where it is desired to quickly restore a wet cable to service until such time as a sheath opening can be located and permanent repairs made. It also is useful in drying out moisture which has run in to the underground duct section from a defective splice in a manhole. The gas may be applied on either one or both sides of the defective splice or sheath opening as the gas must pass through the wet insulation and out through the sheath opening in order to drive out the moisture. Fig. 10 illustrates how gas would be applied for the several different situations involving wet cable. The effectiveness of this method of drying out cable will depend largely on the size of the sheath opening and the amount of moisture in the cable. If the opening

Whether or not exchange cable can profitably be maintained under gas pressure is still an open question. At least some experiments in this direction would seem worthwhile. The advantages of freedom from service interruption that would accrue from the use of gas plus the saving in time required to locate and correct sheath openings appear attractive. The disadvantages of the use of gas would be the cost of providing gas tight terminals, pressure testing points, and the associated equipment required to make such a system operate. Some additional maintenance expense would result due to the necessity of taking readings of gas pressure at various points throughout the exchange cable plant at periodic intervals.

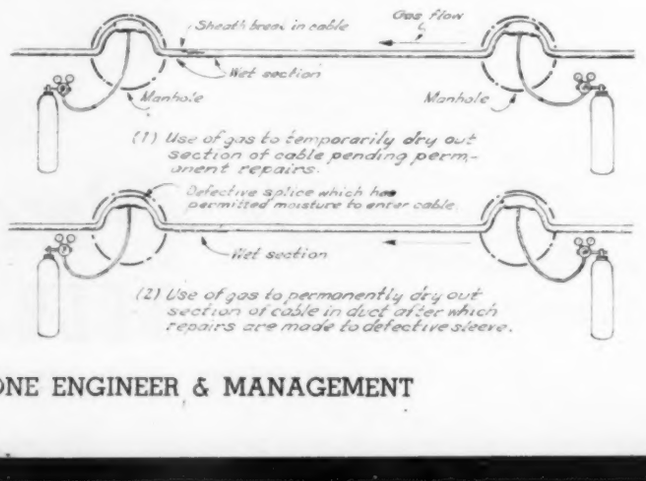

Sheath break in cable
Gas flow
Wet section
Manhole
Manhole
(1) Use of gas to temporarily dry out section of cable pending permanent repairs.
Defective splice which has permitted moisture to enter cable
Wet section
(2) Use of gas to permanently dry out section of cable in duct after which repairs are made to defective sleeve.

Fig. 10—Use of gas to dry out wet cable.

## Postwar Employment at Sylvania To Be Double 1941 Figure

An increase in employment by next January 1st of more than 100 per cent over the 1941 level was predicted for Sylvania Electric Products Inc. by M. F. Balcom, vice president and treasurer, at a special meeting of the company's stockholders recently. Mr. Balcom estimated that the company's sales volume for 1945 would be over $100,000,000.

The stockholders authorized the issuance of 100,000 shares of new $4 cumulative preferred stock and approved a charter amendment necessary to provide for a change in the capital structure. Mr. Balcom said that the company will use a portion of the proceeds of this financing to retire the outstanding 3¼ per cent sinking fund debentures due June 1, 1957.

Commenting on the company's performance during the reconversion period, Mr. Balcom stated that "Sylvania employed an average of about 6,000 persons in 1941. By the first of the coming year we expect to have at least 13,000 persons at work.

"War contract cancellations were severe, but our physical problems of conversion are not too severe and are well under way. Had war contracts remained in force we would have finished 1945 with total sales of substantially more than the $100,000,000.

"The largest cancellations affected our work on the now famous "VT" or proximity fuse. On this project alone, for which Sylvania Electric has been the Navy's sole supplier of tubes for the last two years, there were as many as 15,000 persons engaged at one time, working under the strictest secrecy. A total of more than 140,000,000 tubes were made for use in "VT" fuses. The company also was one of the largest assemblers of the fuse itself at its Ipswich, Mass., and Dover, N. H., plants.

"Expansion plans for Sylvania," declared Mr. Balcom, "include new buildings and a warehouse at Loring Avenue, Salem, Mass., and the erection of at least two buildings at Sylvania Center, Bayside, L. I. The two buildings at Bayside will include one for research and one for administration centralization."

Sylvania's wholly owned subsidiary, Colonial Radio Corporation, had a more serious reconversion problem changing from the manufacture of aircraft radios to private brand home radios and auto sets. However, it is expected that they will have from 2,000 to 3,000 persons at work by January 1st. A Colonial plant in Bloomington, Ill., is nearing completion, and another Colonial plant will be built at Riverside, Calif.

## Sweden's Exports Resumed to Brazil

Three thousand telephone instruments, imported from Sweden, were recently installed at Fortaleza, Brazil. In addition to this, one of the first direct transports from Sweden arrived in Rio de Janeiro in September, carrying merchandise including 369 cases of telephone material.

## Rebuilding Program

An extensive program of rebuilding lines, taking several years to complete, has been started by the Iowa Telephone and Telegraph Company in the territory covered by the five exchanges of Edgewood, Strawberry Point, Arlington, Volga and Wadena, Iowa.

The project calls for resetting 375 miles of poles, or approximately 9,000 poles, and the company has on hand 400 poles as a starter. A new truck and hoist, to aid in the work of setting poles is on order. Eventually all five exchanges will be converted to the dial system.

IN keeping with the high quality of Vacuum Grip Pliers we give them a finish that represents top craftsmanship in the surfacing of metals.

Whether in full chrome or plain steel, the smooth, lustrous finish of a pair of Vacuum Grip Pliers—the result of many buffing processes—rivals the flawless velvety finish of a deep sea pearl.

Public Utilities Companies value Vacuum Grip Pliers as an investment for their high-economy record. Linemen and electricians are proud to own and use them because their superb finish is the sign of a quality tool.

For full particulars call your local Snap-on Branch or write to us direct.

**SNAP-ON TOOLS CORPORATION**
Kenosha, Wis.

**Vacuum Grip Pliers**

At the Stromberg-Carlson school for its telephone sales force seated L to R: Donald E. Lee, sales rep., Rochester, N. Y.; John R. Hubbard, sales rep., Chicago, Ill.; Robert H. Wallace, sales rep., San Francisco. Standing L to R: Joseph R. Thompson, sales rep., Chicago, Ill.; Chester J. Reynolds, supply sales, Chicago, Ill.; R. Fred Fairly, sales rep., San Francisco; Pete Winemiller, sales eng., Kansas City; John T. Barrett, sales rep., Rochester, N. Y.; Harold T. McCaig, Jr., supply sales, Rochester, N. Y.; Harold T. McCaig, Sr., manager Chicago office; Colby H. Knapp, supply sales mgr., Chicago, Ill. Back Row, L to R: William C. Lyon, sales rep., Kansas City; Charles F. Sanders, sales eng., Chicago, Ill.; Randolph D. Shoemaker, sales rep., Chicago, Ill.; Walter E. Carlson, sales rep., Rochester, N. Y.

## Stromberg-Carlson Conduct School

Stromberg-Carlson held two sales schools, the first was held during the weeks of October 7-14 and the second was held during the weeks of October 21-28. Half of the salesmen attended each of these two schools. Held in two sections of two weeks each, the school's purpose, according to Vice President Lloyd L. Spencer, is to acquaint the new and veteran telephone representatives with the latest in communications techniques.

Chairman and school master is Truman C. Thompson, newly advanced telephone sales manager. Says Mr. Thompson, "During the war, the Telephone Sales Division was reduced to a minimum. Salesmen were recalled to the factory and aided in producing instruments for the armed forces; helped in the then-secret radar and other communications fields. The school is designed to review products made prior to the war and to acquaint the men with the many new war-born developments. Demonstration and forum method of instruction are being used.

"Under the direction of Vice President Frederic C. Young, the telephone engineering division, headed by Dr. Harry R. Reed, has carried the burden of instruction; this in addition to their regular work, which was greatly augmented by the early termination of the war. Sales engineers under Ralph H. Barger also assisted in the conduct of the course."

The school was addressed by Mr. Colby H. Knapp, telephone supply sales manager, from Chicago and representatives of manufacturers whose products Stromberg-Carlson distributes.

A final dinner session of the first section was held at the Rochester Club. The entire group, including officers of the company, heard of early experiences in the telephone field from Wesley M. Angle, chairman of the board. Lee McCanne, vice president and general manager, told the group about the five-year expansion plans for the company; these to include the greatly enlarged new cabinet shop now nearing completion at the south of the plant and the Radio City for WHAM broadcasting AM-FM and Television on the north of the plant, this building to house offices, technical facilities and studios capable of permitting audience participation of 400 persons.

Lloyd L. Spencer acted as toastmaster and Arthur F. Gibson, assistant general sales manager, also attended.

The second two-weeks' section of the school is now in progress and sales representatives from the entire country are in attendance.

## New York Telephone Company Provides Extra Navy Service

With the arrival of the Pacific Fleet in New York Harbor and the Navy Day review on October 27, the New York Telephone Company handled thousands of calls made by many of the 25,000 men and officers in New York for a few days.

## Sylvania Midwest Sales Manager

The lighting division of Sylvania Electric Products, Inc. has announced the appointment of B. K. Wickstrum as midwestern sales manager with headquarters at 135 South LaSalle Street, Chicago. Since 1943 he has been Sylvania's Pacific Coast sales manager directing selling, servicing and engineering activities in the Northwestern and California territorial divisions of the company.

B. K. Wickstrum

After joining the company in 1940 as assistant advertising manager, he was promoted to advertising manager of the lighting division, a post he held prior to going to the Pacific Coast. Previously he was connected with the general advertising department of the Hearst Newspapers in New York; the new business staff of the Washington Times; and the editorial staffs of the Financial Advertising Almanac and General Newspaper Service in New York. During this period, he was also engaged in sales work for these publications.

## FCC Authorizations

The FCC has authorized A.T.&T. to establish its first shore-ship radiotelephone service with the Queen Elizabeth. Illinois Bell was given a month's temporary authority for its station WAY to communicate with a yacht on the Illinois and Mississippi Rivers.

Western Union received FCC permission October 17 to discontinue railroad-operated offices at Saspamco, Texas; Wilkeson, Wash.; Kidder, Mo.; and Cedar Bluff, Ala., provided no additional telephone toll or other delivery charge will be incurred against users.

## How the Electron works for you

Here is the kind of book you have been awaiting—an ABC book which will show the average men what electronics is all about. This book gives you simply—without formulas or much mathematics just what you want to know about electronic principles and how they are applied in working devices.

***Just Published***

# A PRIMER OF ELECTRONICS

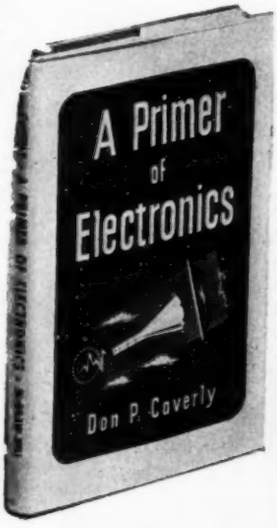
By Don P. Caverly, Commercial Engineer
Sylvania Electric Products, Inc.

***235 pages, 5½ x 8½, illustrated, $2.00***

Here is an especially clear and simple explanation of electronics and electronic tubes and circuits, for all concerned with the manufacture, application or operation of household or industrial electronic devices.

**• The text is concise and written in language that anyone can understand, yet is technically authoritative and complete.**

**• More than 125 specially prepared illustrations are an important factor in the clarity of the treatment.**




The book begins with the atom, the electron, and satic and electron discharges and takes the reader step by step through explanation of electric current, magnetism, and electromagnetic radiation, to an understanding of simple radio tubes, fluorescent lamps, cathode ray tubes, ignitron, thyratron, and other tubes and their basic connections for practical purposes.

**The book covers concisely, practically, so that any one may understand, such topics as:**

Production or radio waves
Reception of radio waves
Short-wave radio
Frequency modulation
Television transmission
Television reception
Ultra-high frequencies and microwaves
Ranging and Directing by radio
Infrared
Ultra violet
Hot cathode fluorescent light sources
Fluorescent-lamp circuits
Cold cathode fluorescent light sources
Bactericidal tubes
Strobotrons
Photo-electric tubes
Cathode-ray tubes
Iconoscopes
Image-dissector tubes
Facsimile recorder tube
X-ray tubes
Electron miscroscope
Electron tubes in general

**To Avoid Delay Please Enclose Remittance With Order**
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**TELEPHONE ENGINEER BOOK CORP.**

**7720 Sheridan Road** **Chicago 26, Ill.**



## You can make better pair splices . . . faster

## *The Nicopress Way*

***The National Telephone Supply Company***

5100 SUPERIOR AVENUE • CLEVELAND 3, OHIO
*Canadian Mfr* —
N. SLATER CO., LTD., HAMILTON, ONTARIO, CANADA
*Export Distributor*: INTERNATIONAL STANDARD ELECTRIC CORP., NEW YORK, N. Y.

PREMAX

**Metal Pole Markers Again Available**

Stamped and embossed in 99% pure aluminum, Premax Metal Markers for all pole and public utility identification are ready in standard and special designs. Write for details.

*Premax Products*

**Division Chisholm-Ryder Co., Inc.**
**4608 Highland Ave., Niagara Falls, N. Y.**

## Bell Legal Department Changes

A change in The Ohio Bell Telephone Company's legal department has just been announced by Randolph Eide, the company's president. All of those affected by the change are Clevelanders.

Carlyle Tresise, general attorney, has been appointed general solicitor, succeeding Ashley N. Van Duzer, who became general counsel.

Edwin N. Strand, Ohio Bell attorney, succeeds Mr. Tresise as general attorney, and the position of attorney vacated by Mr. Strand has been filled by Arthur E. Acklin, who has been associate attorney.

## New President of Pioneers

Randolph Eide, president of The Ohio Bell Telephone Company, has been elected president of the Telephone Pioneers of America.

The organization is composed of telephone workers who have had 21 or more years in the telephone business in the United States and Canada. Mr. Eide beats that requirement by nearly 14 years, as he will receive his 35-year Bell System service emblem next March.

There are more than 97,000 telephone pioneers in the organization, of which approximately 3,300 are members of N. C. Kingsbury Chapter No. 2, which covers Ohio Bell territory. Mr. Eide was president of this Ohio group from July, 1939, to June, 1940.

Randolph Eide

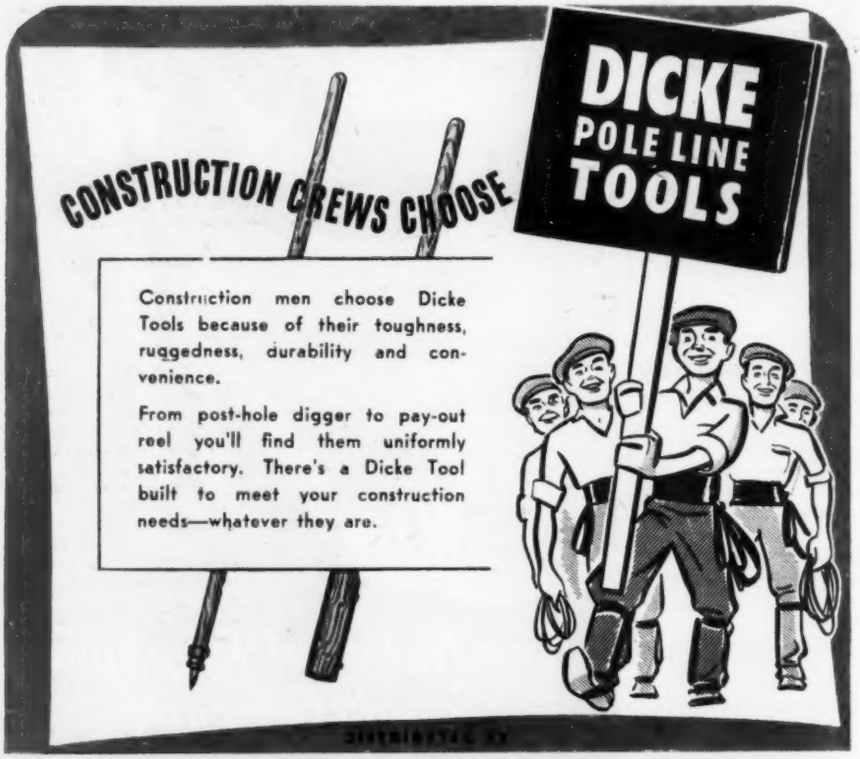
## Gasoline Hammer

The Syntron Company, 927 Lexington Avenue, Homer City, Pa. announces an improvement in the design of the tool retaining arrangement of its self-contained, portable gasoline hammer paving breaker.

For additional information about these gas hammer paving breakers—the tools to be used with them—and the various uses to which they can be put—send a postcard to New Products Editor, Telephone Engineer Publ. Corp. 7720 Sheridan Rd., Chicago.

The nose-end arrangement has been redesigned to utilize the resiliency of a spring-tool retaining clip, as illustrated.

This eliminates the solid latch mechanism previously employed and commonly used in this type of demolition hammer for retaining the tool in the hammer.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**Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of March 3, 1933,**

of Telephone Engineer and Management, published monthly at Pontiac, Illinois, for October 1, 1945.

State of Illinois, County of Cook, ss.—Before me, a notary public in and for the State and county aforesaid, personally appeared Ray W. Smith, who, having been duly sworn according to law, deposes and says that he is the editor of the Telephone Engineer and Management, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc, of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—Telephone Engineer Publishing Corp., 7720 Sheridan Road, Chicago, Illinois.

Editor—Ray W. Smith, 7720 Sheridan Road, Chicago, Illinois.

Business Managers—Ray W. Smith & Roy F. Smith, 7720 Sheridan Road, Chicago, Illinois.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address as well as those of each individual member must be given.)

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Ray W. Smith, 7720 Sheridan Road, Chicago, Illinois.

Roy F. Smith, 7720 Sheridan Road, Chicago, Illinois.

3. That the known bondholders, mortgagees, and other security holders owning or holding one per cent or more of total amount of bonds, mortgages or other securities are: (If there are none, so state.)

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4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

RAY W. SMITH,
Editor.

Sworn to and subscribed before me this 21st day of September, 1945.

(My commission expires Sept. 20th, 1946).
(Seal)

B. W. BECKING,
Notary Public.

## Increased Rates

The Audubon (Minn.) Telephone Company received permission, October 22, from its state commission to place in effect in November increased rates at Audubon as follows:

| Class of Service | Former Net Rates | Present Net Rates |
|---|---|---|
| Individual line business.. | $1.75 | $2.00 |
| Two-party line business.. | 1.50 | 1.75 |
| Four-party line business.. | 1.25 | 1.50 |
| Individual line residence | 1.25 | 1.50 |
| Two-party line residence | 1.25 | 1.50 |
| Four-party line residence | 1.00 | 1.25 |
| Rural multi-party — company owned..... | 1.00 | 1.25 |

## Litchfield and Murphy Promoted By Graybar Electric Co.

Harold P. Litchfield, formerly commercial sales manager, assumed the duties of assistant general sales manager of Graybar Electric Company, November 1. The announcement was made by A. H. Nicoll, president of the company, at a luncheon given in honor of Mr. Litchfield's 30th anniversary of service.

E. F. Murphy H. P. Litchfield

Effective November 1, E. F. Murphy, completing more than 25 years' service, took over Mr. Litchfield's duties. In addition to his new national accounts assignment, Mr. Murphy will continue his activities as eastern commercial sales manager.


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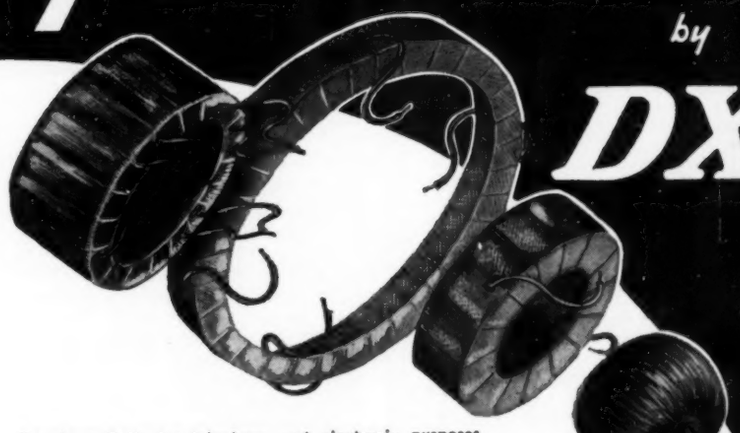

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Western Elec. No. 2C Ball type drops and jacks per strip 5 @ 8.25

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WANTED: Assistant to General Manager for large telephone property. Must have executive ability and administrative experience. In application furnish information as to age, education, experience, present employment, draft status, small photograph, recommendations, etc. Write Box 8386, c/o TELEPHONE ENGINEER.

WANTED: Plant Superintendent for large telephone property. Good salary for man having qualifications. In replying, furnish complete information as to age, education, experience, present employment, draft status, small photograph, recommendations, etc. Write Telephone Services, Inc., 16th Floor, Lincoln Tower, Fort Wayne 2, Ind.

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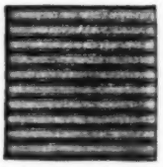

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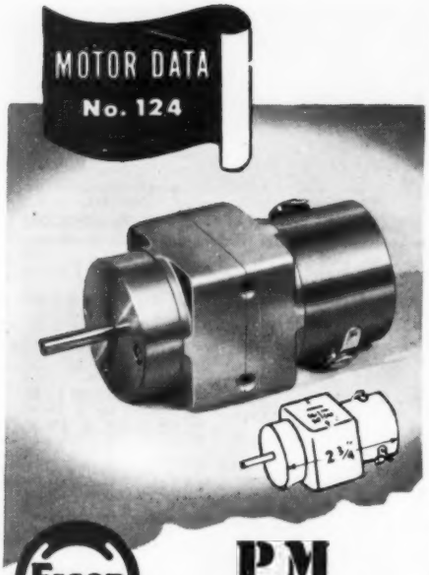


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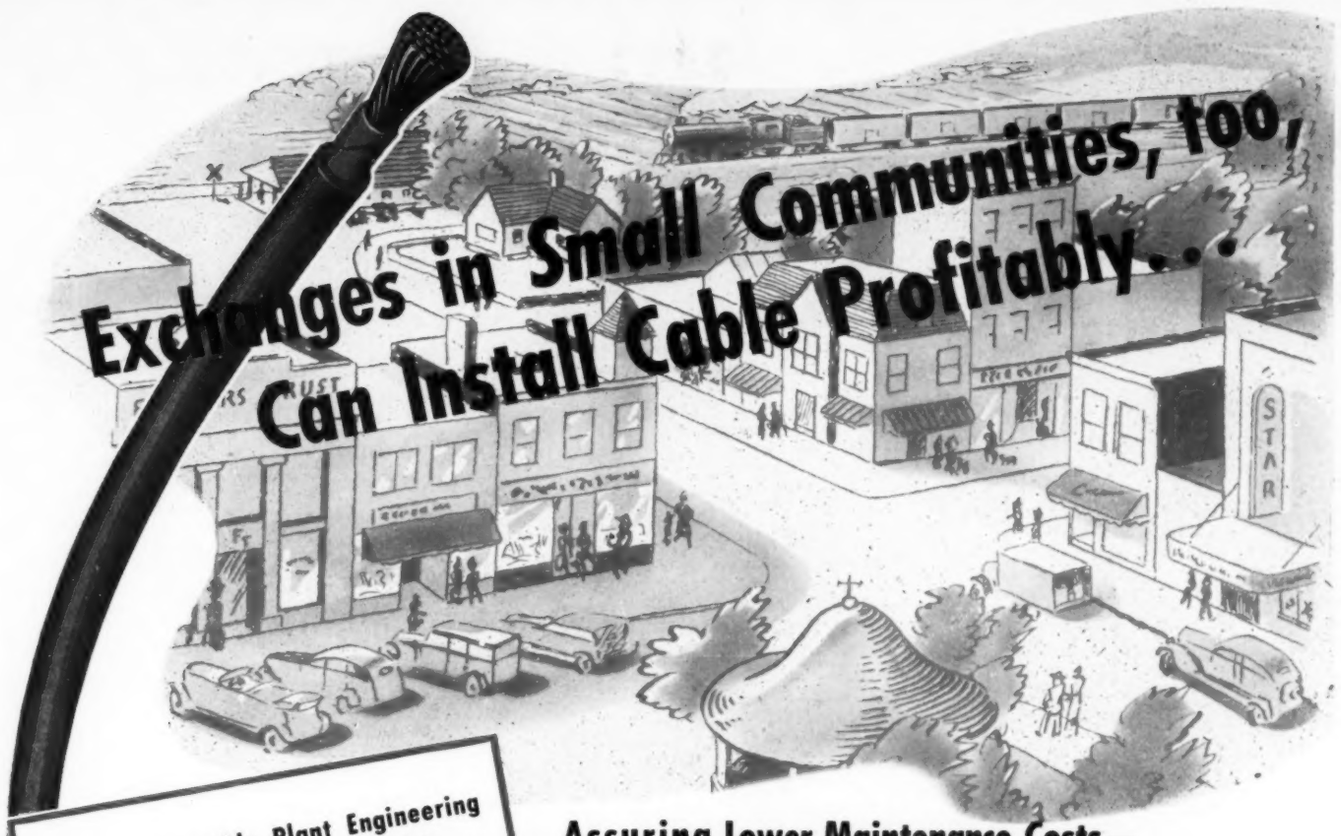


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